

COAL AGE

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Every Man Has His Own Gas Plant

EVERY house furnace gasifies its own fuel and burns the gas for heating. Isolated units of such small dimensions would seem utterly uneconomical. They may pass eventually into the discard, but just at present the household furnace seems firmly established with all its inefficient combustion and its high costs of attendance. Surely the gas men must find a better way before long, but until they reduce the price of gas the present antiquated system will continue. The gas men certainly should explain why they have been making so little of their large opportunities.

Everybody Happy

PARTIES having opposing interests rarely succeed in writing consistent platforms. The recent Democratic program has this character of inconsistency. To please certain Western delegates the following plank was written: "Mining is one of the basic industries of this country. We produce more coal, iron, copper and silver than any other country. The value of our mineral production is second only to agriculture. Mining has suffered like agriculture and from the same causes. It is the duty of our government to foster this industry and to remove the restrictions that destroy its prosperity." This plank will be a good one to appease the demands of the mining region, especially in the West.

The coal men do not ask to be fostered, not at least in the year of grace 1924. Not since the war has the coal man had the notion that he wanted governmental coddling. Before the war the coal industry in Illinois believed it might be possible to obtain a modification of the Sherman Act to allow the forming of a combination that would permit the fixing of a fair price. The Illinois operators believed that they might, and should be, allowed to follow the example of Germany under government supervision. Soon after, they found the market favored highly profitable operation and changed their minds. When their balance sheet showed black figures they became opposed to any government control and so no longer advocated any change in the law.

The plank just recited seems to them suprisingly equitable and more than they could have hoped to attain, but its strength is sapped by what follows: "We pledge the Democratic party to regulate by governmental agencies the anthracite coal industry and all other corporations (sic) controlling the necessities of life, where public welfare has been subordinated to private interests." That will please the consumer states, especially New England. So the platform in places suits both consumers and producers, all according to the particular plank quoted.

It is ill written because opponents in consumer states can quote the anti-consumer plank and in producing states can quote the anti-producer plank. Consequently the program is acceptable to everybody—to Republicans

because it can be quoted against the Democrats, and to Democrats because the plank can be quoted to Democratic audiences as the audience addressed would prefer. The mining planks, therefore, are masterpieces; everyone will find in them just what he wants to prove his case.

Knowing Versus Guessing

NOTHING is safer than knowing, yet how few are the companies who really know just what they are doing. Nevertheless, more is known today than even a few years back. Most of them know the labor cost of mining, deadwork, ventilation, trackwork, drainage and so forth, but almost none know the actual power costs of these various items and few the supply costs. They cannot compare the power and supply costs between mine and mine, nor tell how they vary from month to month. Having no means of comparison they do not know which are high and which low and cannot tell what they should do to keep the costs down.

If, however, it is well to know labor costs; if knowing the costs has reduced them, surely it would be advantageous to learn the power and supply costs in order that similar efforts may be expended in their reduction. It would be well to meter the various power uses, to know how the power, supply and repair costs of locomotives, machines and fans vary so that economy may be sought in each and rules be formulated that will reduce them all to an irreducible minimum. When we can set a mark at which to aim, we can come nearer the goal. Of course, costs will vary with grades and distances in the case of locomotives, with the kind of coal cut in the case of machines and with the resistance and air delivered in the case of fans, but by a comparison of month with month and operative with operative much will be learned and costs will be reduced. Between knowing and guessing, who will not choose the former?

Have a Heart

TOO OFTEN the wiring diagrams furnished with electrical equipment, especially for automatic apparatus, are too complicated for even a professional puzzle expert to unravel. The Behistun rock has no more perplexing symbols.

To the designing engineer who is forever dealing with complicated connection diagrams a statement like this probably sounds foolish. Perhaps he would be inclined to be even a bit critical and say that the man who couldn't follow his diagram was not much of an engineer.

But almost every electrical manufacturer uses signs and symbols peculiar to his own drafting department, and the mine electrical engineer, who of necessity must purchase equipment made by many different companies, must learn the particular style of each.

It is not unusual to find the electrical equipment used

in any modern substation or power plant made by six or seven different manufacturers. Often this means that six or seven wiring diagrams must be understood and then changed into one which shows the whole wiring layout of the plant.

Would it not be advantageous for the manufacturer to simplify these diagrams, standardize them a little more, so that the mine engineer would not be scared away from buying new forms of equipment which would suit his requirements much better than the old types with which he is more familiar? Manufacturers must not forget that the equipment must be maintained by the men at the mines who, rather than admit they do not understand certain wiring diagrams, very heartily condemn apparatus which is accompanied by a complicated connection blueprint.

Manufacturers should never overlook that progress in industry always has been delayed by the fear of the purchaser or his agent that he will not be able to handle the equipment satisfactorily. Consequently it pays to depict the connections so that they will be understood, and to design the machine so that a minimum of information and brain power will serve to operate it.

As It Is Done Abroad

A REPORT on the Causes of and Circumstances Attending the Inrush of Water Which Occurred at the Redding Colliery, Falkirk, Stirlingshire, on the Twenty-fifth of September, 1923," by Sir Thomas H. Mottram, Chief Inspector of Mines, and presented to Parliament by command of His Majesty, appears on the editorial desk. This little book is headed by the royal arms with the lion and the unicorn as supporters. It has thirty pages of text and five large folding plates.

Only forty men were killed at the Redding Colliery by that inrush of water. We have been wondering how many volumes of text would be written and possibly should be written here about our mine disasters, often larger and always more numerous than those in Great Britain, if we gave printing space to the subject equal to that which is devoted to it there.

But we let the press carry the story. We shudder, pass on and forget. Perhaps if we took the matter more seriously it would be possible to reduce the number of accidents. Our state reports in earlier years used to enter into much detail on mine accidents and explosions, gave maps that illustrated the whole story and showed interesting devices for promoting safety. Today accidents are boiled down to statistics—the number of victims, the date of the occurrence and little more. We have become calloused to the misfortunes of our mine workers. The story hardly ranks any longer as a headline.

As for the Redding disaster, on which this little preachment was based, it was caused by an uncharted area in an old mine that had filled with water and was potential for mischief. The water escaped through a dyke from a seam higher up and drowned the men. It appears likely that a new law further defining the proper procedure in places approaching water will be passed to prevent such accidents in future or that the Water Dangers Committee will prescribe the removal of all such dangerous accumulations of water. The report recommends the use of more telephones, that the miners be better informed as to emergency exits and that someone be placed in charge of the deputies on the night

shift. One is impressed with the idea that the report gives evidence of an activity that will endure. If in the United States we had an accident Sept. 25 of one year it would be forgotten by April 1 of the year following, the date when the account of this disaster with comments was forwarded by the Mines Department to E. Shinwell, the Secretary of Mines. Is this patience in following up disasters the cause for the low fatality rate per thousand men employed now attained by Great Britain? Is the interest of Parliaments in a disaster of the kind eight or more months after its occurrence a reason why mine accidents are less frequent and less destructive in at least some lands beyond the seas?

Acquaintance Takes Edge off Disagreements

WE HEAR so much about the failure of civilization in the World War and in other ways. We forget that in times past war was the normal state of peoples and that it is still quite a usual condition in uncivilized communities. Where people do not meet, except perhaps in battle, they can imagine all kinds of things about each other. Travel and acquaintance make wars less frequent. It is true that civilization has made them more devastating, but it has also made the public less ready to indulge in them.

To know your neighbor is to arrive at a certain degree of appreciation of him. Many a man has been able to revile another till he met him. Many men with intense animosities are disposed to keep away from their adversaries lest closer acquaintance cause a reconciliation. Few people can harbor a resentment against those they know well.

As the outward appearance of a man is usually a symbol of his character, the press has done yeoman service for international, national and industrial unity and good will by publishing portraits of prominent men. Plant publications always make much use of portraiture. A sort of kindred feeling arises among men who know at least the outward seeming of those with whom they are associated in business and other relations.

We wonder that the press finds so many camera-shy men. If a man has a face that radiates good will, that betokens a spirit of kindness and fellowship, that shows the bearer of it to be animated by good purposes he should not be unwilling to have it reproduced. He may be sure it will do much to promote harmony and good will. Hardly any face is so devoid of manliness and humanity that the publication of an illustration of it will not serve a good purpose and widen the circle of the man's wellwishers.

The candidates for office are wiser in their generation than the average business men. They have their countenances portrayed on banners, posters and cards as an outward sign of the goodly qualities they possess. He is indeed unwise who keeps from the public those features which have endeared him to his associates and will make his employees and the public recognize him as entitled to their goodwill.

A portrait will usually do more good than reams of panegyric. It will have the advantage of absolute truthfulness. A man cannot harbor mean and unkindly thoughts and purposes without their being reflected in his face. Any man, therefore, who knows his purposes square with the public interest will not be unwilling to let the public see his face or learn, as it has been expressed, "what manner of man he is."



Machine at work in the No. 2 Gas bed

Machines Load More Than 100 Tons per Shift In Mines on Paint Creek, West Virginia

A Large Output per Machine Has Been Obtained, But Mining and Shooting Methods Have Not Yet Been So Adjusted to the Difficult Conditions at These Mines as to Get Full Benefit From Equipment

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AT KINGSTON, W. VA., on Paint Creek, about 30 miles east of Charleston, the Kingston Pocahontas Coal Co. has four loading machines in operation in its mines. All of these machines are doing good work and turning out large daily tonnages in spite of adverse conditions, natural and otherwise. At Burnwell, 9 miles farther up the creek, the Imperial Colliery Co. has one machine at work in its Imperial No. 4 mine. This loader also is doing well both in tonnage produced and in costs registered. The former company began its experiments about 18 months and the latter firm about a year ago.

Both of these companies have gained sufficient experience with mechanical loaders to enable them to accurately sense the requisites for satisfactory machine operation under the conditions existing in their respective mines. Neither has any complaint to make concerning the capacity or productiveness of the machines themselves, both attributing the only moderate degree of success thus far attained from their use to the natural conditions encountered and the methods of mining followed.

NOTE—Coal in headpiece shows the results of heavy shooting. In spite of this, however, much of the coal hangs in the corners and has to be broken down by hand. The flat lumps on the machine are portions of a band of tough woody coal that occurs near the bottom of the bed.

So far as output per machine is concerned both companies have been highly successful, as well over 100 tons are regularly loaded per 8-hr. shift. This compares favorably with the results generally obtained elsewhere. Nevertheless, there still remains room for vast improvement. This will be gained by adjustments in the room layout, track arrangements, the methods employed in shooting the coal, a proper distribution of labor and assignment of duties in well-planned schedules and cycles of operation. All this will take time and study. The resident officials at the mines of each company realize the disadvantages under which their machines operate and the inefficiencies in their present practices, and make no attempt to conceal either. Each day they get new ideas and see ways by which their methods may be improved. Changes are being made slowly but surely.

In the mines of the Kingston Pocahontas Coal Co. the four machines have proved their ability to load coal easily at a rate of one ton per minute, and to move from place to place as rapidly as a cutting machine can be shifted under similar conditions. Nevertheless, they have not been economical when working in rooms, though they save money in entry driving. One mine car after another has been loaded at the rate stated. Throughout December, 1923, each of two machines

working the Eagle bed in the Westerly mine of this company averaged 120 tons in eight hours.

Notwithstanding this excellent performance, however, the labor cost per ton of machine-loaded coal is no less, or at least, not appreciably less, than that of hand-loaded coal. This discrepancy does not lie with the degree of efficiency of the labor employed. The saving made in actual loading is more than counterbalanced by the cost of deadwork.

LARGE TONNAGE MAY NOT SIGNIFY LOW COST

It is one thing for a loading machine to be successful in performing its duties, but quite another for it to be economical. A measure of any machine's economy is not the number of tons of coal it will load in a given time, but rather the number of men required to win and prepare the coal, as well as the average return realized per ton on all sizes made. Even under unfavorable conditions the rate of machine loading may be speeded by employing during the off shift enough additional men to prepare the places properly for the operation of the loading machine. A loading machine, however, which may be economical under certain conditions may be quite uneconomical under those less favorable. This circumstance, however, casts no reflection whatever upon the machine itself.

In the mines of this company the Eagle bed exhibits several characteristics of the Pittsburgh seam in the Connellsville region. Both beds yield coking coals; their analyses are similar, and little difference is noticeable in their physical texture. The bottom is of fireclay which when wet makes the shifting of a loading machine difficult. Ten inches of drawslate overlies the coal which has an average thickness of about 7 ft. Above this slate is a soft shale bed which slacks, on exposure to the air and comes down to heights of as much as 7 ft. above the top of the coal.

In places the roof above the Eagle seam, like the drawslate above the Pittsburgh bed, pinches out, leaving in its place a hard sandstone top. Unlike the Pittsburgh bed, however, in limited areas of the mines, a middle parting separates the Eagle seam into two benches. The cover above the mines of this company is much thicker than that generally found overlying the Pittsburgh seam, for the properties are situated in a mountainous section of Kanawha County. The roof breaks without difficulty when the work in rooms and pillars is done in proper sequence.

The many characteristics common to both the Eagle and Pittsburgh beds make practically the same mine layout desirable in both measures. The Kingston Pocahontas Coal Co. drives its rooms 20 ft. wide and 300 ft.

long on 60-ft. centers. Necks are driven 12 ft. wide and about 25 ft. long. Pillars are recovered in practically the same manner in the Eagle as in the Pittsburgh bed. Loading machines are not utilized for pillar drawing. So far as this process is concerned, however, loading machines are seldom so employed anywhere. Occasionally, in the mines of this company, one or two slabbing cuts are loaded out mechanically before the pillar is brought back by the usual methods of hand loading.

The drawslate above the Eagle bed in the mines of the Kingston Pocahontas Coal Co. has prevented material savings being made in the mechanical loading of coal. Where this slate is sound and the coal is loaded by hand, it can be kept in place by careful timbering. With machine loading there is little choice between keeping it up with timber and taking it down. When unsupported for 12 ft. from the face what is apparently sound roof will spring, so that it must be taken down. When the slate is supported by timber a loading machine can be maneuvered only with difficulty, for the timbers have to be shifted, which is a hazardous operation. To take this slate down before the loading machine enters the place is prohibitively expensive, for it costs approximately as much to load it by company men as is saved by the loading of coal by machine. The additional picking, which mechanically loaded coal requires, should be added as another item of expense.

NIGHT LOADING ASSURES PLENTY OF CARS

In these mines loading machines are used on the night shift so that a sufficient number of mine cars can be furnished to keep the machines busy. Obviously this is the best procedure to follow, because, if practiced simultaneously, the operations of machine-loading and hand-loading would conflict. The two cannot well be prosecuted at the same time.

To load 120 tons by machine in eight hours 14 men working in two shifts are required. Six men are employed on the night shift—a machine runner, two helpers, a trimmer, a motorman and a trip rider. Sometimes, when the locomotive is coupled to the mine car being loaded, the trip rider trims the coal and picks as much slate from it as he can. In the absence of the trimmer during the shifting of a loaded trip to the parting, one of the machine helpers takes his place. With this arrangement only five men are employed on the night shift.

There should be little need for a trimmer. Mine cars loaded by machine should not be heavily topped, nor can the trimmer pick out much slate so rapidly does the machine load the cars. The two helpers facil-

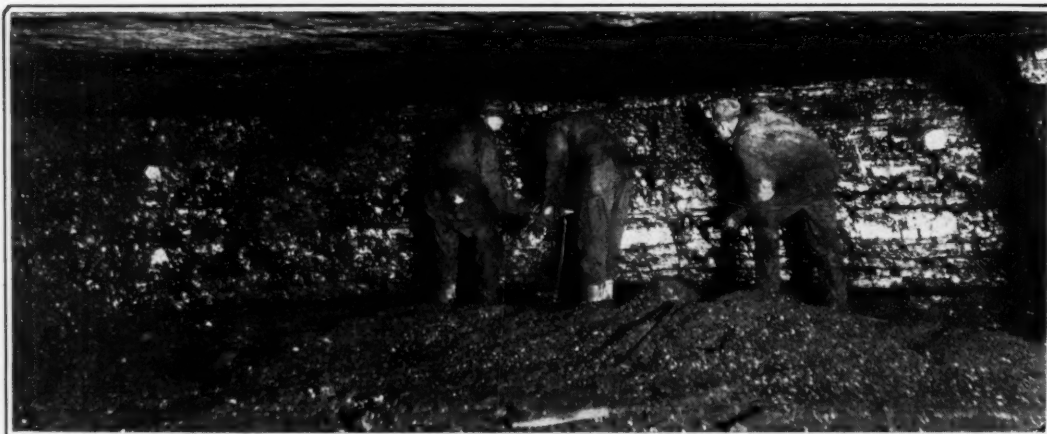


FIG. 1

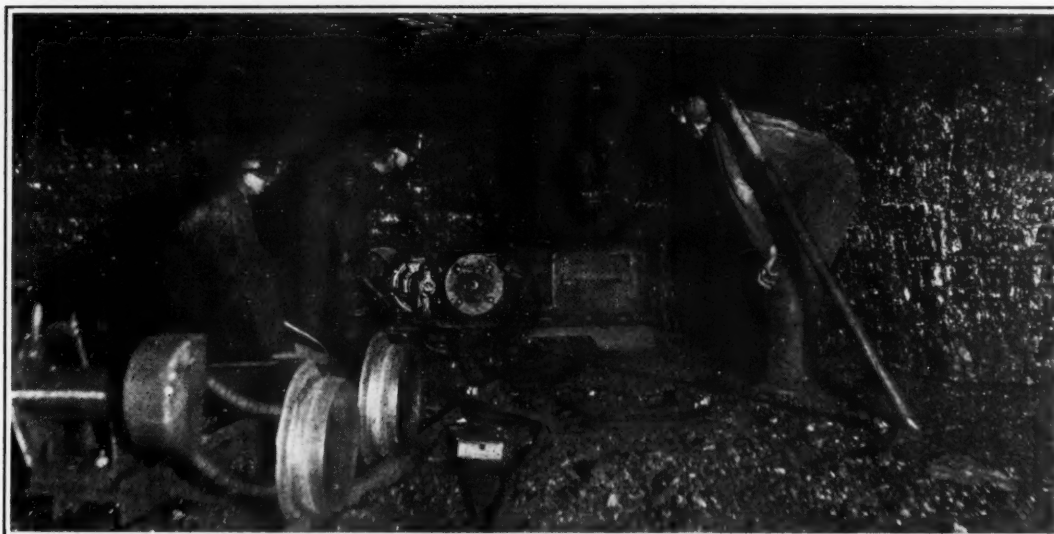
Drilling Shotholes

Electric coal drills used at the face save much labor. Six shots are ordinarily necessary to bring down a face in the No. 2 Gas bed for loading mechanically as against three with hand loading. Positions of holes to be drilled are indicated by the chalk marks on the face.

FIG. 2

Squaring Break-through Face

In the Imperial No. 4 mine the mining machines cut a kerf below the 4-in. band of tough woody coal. The strong roof requires little timbering. This allows ready movement of both undercutters and loading machines. A tender roof sometimes requires so much timber that the machines can be maneuvered only with difficulty.



itate speedy loading by shoveling coal at the face into the path of the machine when they are not engaged in picking down hanging coal. With more study will come a solution of the problem of shooting the coal to advantage. This should eliminate at least one of the helpers.

On the day shift eight men are employed in preparing the faces for the loading machine. The duties of four of these men include the shooting of coal, laying of track and timbering. About half the time of a cutting crew, or the full time of one man, is required in undercutting the requisite number of places to yield 120 tons of coal. Three are engaged in handling slate. This represents a heavy labor charge, which is not incurred where the roof directly above the coal is sound.

At least 80 per cent of the coal produced by this company from the Eagle bed is sent to byproduct-coke plants. In consequence, when shooting, no attempt is made to obtain a large percentage of lump. Places are center-cut by breast machines mounted on trucks. The bottom bench, of course, is shot first. From 6 to 10 shots are used depending upon the width of the place. Heavy shots are fired in order to bring down as much of the coal as possible, for no tight corners or hanging coal should be left on any part of the face.

In this 7-ft. bed it might be possible to use loading machines economically merely by top-cutting and leaving about 1 ft. of coal to hold the roof. The saving that might result from not having to handle draw-slate, the greater efficiency secured from the machines themselves and the elimination of part of the labor charge for picking no doubt would more than offset the loss of coal left in the roof.

A 6-ton reel-type locomotive is kept in constant attendance on each loading machine. Until the first crosscut in a room is driven, loaded mine cars are stored on the track of the butt entry. When starting to load a cut a locomotive pushes four empties into the room, remaining with them. After the rear car is loaded, the trip is pulled out of the room and the load uncoupled on the straight track. The locomotive pushes three empties into the room, and so on, going through the same cycle for all but the last mine car. This last car is spotted under the conveyor of the machine, and the locomotive is uncoupled. It then leaves the room, and is coupled to the three loads on the entry, which it takes to the parting, returning with three empties.

In rooms that are further advanced a switch and track are maintained in the crosscut nearest the face

for the storage of cars. With this arrangement little time is lost in shifting. A 3½-ton mine car may be filled with 3 tons of coal in 3 min. when the faces are properly prepared. The average time of replacing a load with an empty at the machine is 1½ min.

Conditions detrimental to the economical use of loading machines in rooms are less serious in entries. These passages are driven 12 ft. wide. Narrow work, as might be expected, develops less roof trouble. For rapid development machines should load two cuts per shift on each entry face.

This company by no means has given up the idea of using loading machines in rooms, for in one section off 14- and 15-right entries the coal thus far mined has a sandrock top which, if it persists, is ideal for loading-machine operation.

HAVE HAD MACHINES EIGHTEEN MONTHS

During its 18 months of experimentation with mechanical loading the Kingston Pocahontas Coal Co. has attempted to measure the ability of machines to supplant hand labor. Regardless of the outcome of the experience so far gained, it has profited from it. It knows what changes should be made and what conditions must be overcome to make mechanical loading profitable in its mines. Best of all it has proved the worth of loading machines for driving entries.

At the Imperial No. 4 mine of the Imperial Colliery Co., Burnwell, W. Va., one loading machine is used in the No. 2 Gas bed. During one year's service this loader has conclusively established a claim for putting coal on a mine car at a cost less than would be incurred in loading by hand. All work connected with the mining of coal by this machine is performed by company men.

The physical properties of the No. 2 Gas bed of the Imperial No. 4 mine are more favorable to machine mining than those of the Eagle seam in the mines of the Kingston Pocahontas Coal Co. In the latter the coal is 7 ft. thick, and in restricted areas is divided by a 6-in. parting. It has a roof of drawslate subject to weathering on exposure to the air, and a fireclay bottom. The advantages in the Imperial No. 4 mine are such that a saving of 24c. per ton is obtained by the use of the loading machine.

In this operation the roof is of massive blue shale that possesses interrupted cleavage and which stands with a minimum of timbering. Directly above this slate is a 30- to 40-ft. bed of hard sandstone. The cover,



Fig. 3—Double Track to Facilitate Loading

The two spur tracks are joined to the room track by a sliding joint. Four or more cars in a trip may be so shifted by a locomotive as to keep an empty car available for the loading machine most of the time. The track was laid temporarily in order to get the picture from which this illustration was made. In actual practice steel ties are used exclusively.

attaining in places a thickness of as much as 800 ft., is divided at widely separated points by vertical cracks, known locally as "surface seams." The depth to which these cracks penetrate the cover is not known, but it is supposed that they extend into the sandstone because of the apparent ease with which the cover moves along these surfaces of weakness, also because of the flow of water through these channels. Within the coal they may be traced by rusty films or stains.

Though the bottom is of shale, and to all appearances hard, it heaves in some parts of the mine when pillars and barriers take on the weight resulting from a cover that is difficult to break. In one instance 400 ft. of entry heaved even though protected by solid barriers. In pillar sections the bottom often moves over night. This difficulty becomes most serious in drawing the stumps of room pillars, also in removing entry pillars and barriers. In some cases it becomes necessary to lift track, take up the bottom, and then replace it. The characteristics of roof and bottom are not as serious as might be imagined, but those of the roof to a certain extent influence the direction of rooms and the establishment of breaklines.

LONGWALL OPERATION TO BE CAREFULLY TESTED

The coal in this mine is mined at present by the room-and-pillar system; the company proposes, however, to test the applicability of longwall faces to the physical properties of the roof and bottom as here set forth. If this experiment is made, the company expects to operate a straight face, and to hold the roof by means of stout cribbing and timbering at such a distance from the face that track may be laid along it. It is hoped that by working the face parallel to the surface seams these fissures may be made to assist in the caving of the cover, and the control of the roof.

Experiments in longwall mining in this mine are liable to prove discouraging, for the roof strata are composed of much hard sandstone and the bottom is soft. It is probable that on a longwall face the cover will subside rather than cave. Furthermore, the subsidence of the cover, which is heavy in this mountainous district, would squeeze the coal and thus heave the bottom.

In room-and-pillar work in this mine an endeavor is made to keep the breaklines parallel to the "surface seams." This cannot always be done, however, because these cracks do not always run in the same direction. As a result the breaklines in different parts of the mine are not maintained parallel. As M. D. Bouldin, general superintendent of the company, puts it, "Judgment, based on changing conditions, and no one fixed theory found in books, must be followed in this matter."

Thus far no attempt has been made to use the loading machine in drawing pillars, though a trial of its effectiveness in this work is contemplated. The method planned is to drive a 15-ft. place through a room pillar, leaving a 12-ft. stump to be mined in two face cuts by undercutting and loading machines.

Mr. Bouldin is a strong advocate of short rooms, insisting that the rapidity with which such places can be recovered reduces the cost of cleanups and the maintenance of timbers and track, and thus more than offsets the expense of driving room entries close together. Where the rooms are driven short, loading machines lose less time in moving from room to room and in waiting for mine cars to be shifted. In this mine a loading machine will move without difficulty from the face of one room to another, a distance of about 500 ft., in 12 min., including the time required to mount and dismount the track wheels.

Rooms are driven 300 ft. long and 26 ft. wide, on 70-ft. centers. In order to obtain more coal from one room cut and to reduce the number of times a loading machine must be shifted, it is planned in new territory to drive rooms 36 ft. wide on 70-ft. centers, without changing their length. Room and track layouts also are so designed as to give the loading machine a fair chance to load coal. Permanent track will be laid with 40-ft. rails, well-ballasted and bonded, and temporary track will be built of 20-lb. rails on steel ties. Room curves will be turned on 30-ft. radii to facilitate the movement of the machine. Three rooms, and perhaps four, will be assigned to one loading machine.

Crosscuts are to be driven in each pillar at intervals of 60 ft., in the last of which, or that nearest the face, track will be laid for the storage of mine cars; empties on the left and loads on the right. A 6-ton gathering locomotive will be assigned to each loading machine and will never be required to travel more than 60 ft. from it when both are working in a room. While the loading



Fig. 4—Face in Eagle Bed Shot Down Ready for Loading

This coal goes to byproduct ovens. Consequently, aside from the expense for labor and explosives entailed by heavy shooting, a large percentage of slack is not objectionable.

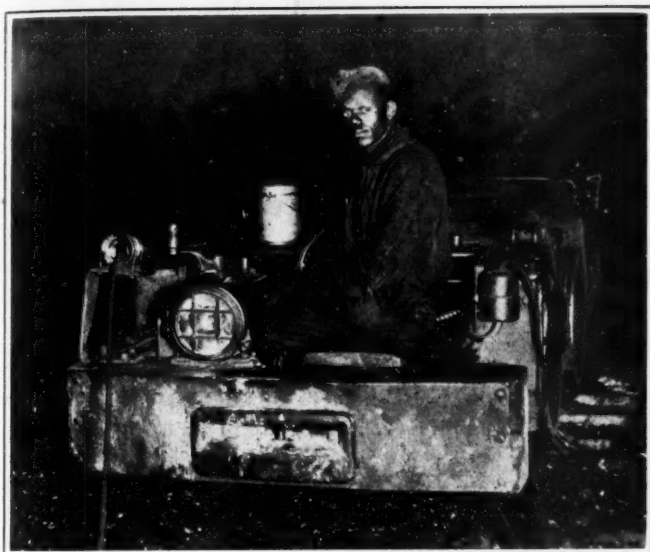


Fig. 5—Each Loader Has Its Locomotive

When rooms are short the locomotive may push a trip in and pull it out depositing the loaded cars successively upon the straight entry track.

machine is moving from one room to another, the locomotive will take a loaded trip to a sidetrack on the main entry and return with a trip of empties.

In conjunction with the crosscut haulage system, if feasible, or separately otherwise, it is further proposed to use a double track at the face of each room. These two spur tracks will be connected with the permanent room track by a diamond or double-throw switch. This track arrangement is shown in one of the accompanying illustrations. The entire section is assembled as a unit. Its rear end can be clamped readily with a sliding fit to the rails of the room track. It is shifted by loosening the rail clamps and attaching the section as a unit to the loading machine by means of a chain. With an arrangement involving either or both of the layouts already described, the company hopes to get 140 tons per machine per shift. After methods of loading and haulage are perfected, the No. 4 mine will be worked mechanically, this, of course, requiring the installation of additional machines.

DOUBLE TRACK AT FACE QUITE HELPFUL

The double-track scheme should be ideal for use in wide rooms requiring little timbering. A locomotive can shift four mine cars or more from one track to another, keeping an empty car available at all times for filling at the end of each track. While the machine is loading the last car in the trip, the locomotive can replace the loaded cars with empties. Under exceptionally strong roof, free of drawslate, as many mine cars might be handled in a single trip as are required to hold the coal produced by one cut.

The haulage method in use at present is that of backing a trip of empties into a room, loading the car nearest the face, pulling the trip out of the room and dropping the loaded car onto the straight track of the room entry, then backing the remaining empties into the room again, and so on. While the last car is being loaded the locomotive makes a trip to the sidetrack with loads and returns with empties. Rooms must be short and the tracks in them kept in good condition to justify this method. At best it is not as satisfactory as either of the arrangements described.

In the Imperial No. 4 mine the problem of shooting the coal in such manner as to facilitate the efficient

use of machines has not been solved. In this operation the No. 2 Gas bed has an average thickness of 5½ ft. It is clean and does not carry the thick parting that occurs in some localities in this measure and in the Eagle bed that lies below it. From 2 to 4 in. from the bottom is a 4-in. band of tough woody coal, scarcely fazed by the bits of an undercutting machine. The coal is undercut below this band. The general practice of the district when shooting this seam for hand loading is followed. One center and two rib shots are used by which the bulk of the coal is adequately dislodged. The bottom band, however, falls flatly upon the mine floor. It usually is broken into such sizes and shapes as can be handled by hand but not by machine.

For this reason, where the coal is loaded mechanically, three light shots are used to break this band into small lumps before the shots above them are fired. The bottom shots, if charged sufficiently to accomplish the purpose for which they are intended, together with the roof shots, make more than the usual quantity of slack. This coal can be correctly shot only by cutting above the hard band. The objections to this method of shooting are obvious, however, if the recovery of this band of coal is desired.

The best record yet made for a single 8-hr. shift is 136 tons. Over a period of 104 full-time working days the machine loaded an average of 112.5 tons per 8-hr. shift. This average output was computed by multiplying the average hourly output over this period by 8. It includes delays due to minor adjustments of the machine, and those resulting from moving the machine and shifting mine cars but not protracted delays.

Nine men will cut and load the tonnage mentioned. The loading machine runner has two helpers. It is reasonable to suppose—as was pointed out in the description of the use of loading machines at the mines of the Kingston Pocahontas Coal Co.—that the services of one or both of the helpers may not be needed, after mechanical loading has been thoroughly systematized.

Two utility men lay track, set timbers, load bugdust and drill shotholes under the direction of the shotfirer in the rooms loaded out by machine. A crew of two men on a 6-ton locomotive is also assigned to the loader. Though mining-machine men are paid by the ton, on a man-day basis the labor of one man can be charged against the loading machine, for a crew of two men can cut twice as much coal in one shift as can be loaded out by one machine in an equal period of time.



Fig. 6—Tipple at Burnwell, W. Va.

Monitors are used to lower the coal from the upper headhouse, or that serving the No. 2 Gas bed. Coal from the lower headhouse, which serves the Eagle bed, is lowered by conveyor.

Mine Safety Due for a Boom in Illinois When New State Council Sets Pace for National Drive

St. Louis Meeting Called by National Safety Council Hears Two-Day Program of Discussion from Rock Dusting to Death by Gas—Hundred Mine Men Want Whole State United!

MINE SAFETY may take a boom in Illinois. A hundred coal-mining men spent two days talking about it in the Statler Hotel in St. Louis, Mo., June 25 and 26, and wound up by laying the groundwork for the "Illinois Council of Mine Safety," an organization that is aimed to lead the country in mine-safety effort. The St. Louis meeting was engineered by the National Safety Council's mining section and brought together coal-company officials, mine-safety engineers, Bureau of Mines field men and regional representatives of the National Safety Council.

The proposed "Illinois Council of Mine Safety" is intended to have a broader scope than the St. Louis meeting. It is to draw together every element and organization that ought to be interested in making Illinois mines and Illinois miners safer. D. D. Wilcox, superintendent at Gillespie, Ill., for the Superior Coal Co., who presided through part of the meeting, is inviting a representative list of men to organize the new state council and project it next fall. Such a council is expected first to unite everybody in a great and continuous safety campaign, to generate enthusiasm for it and to lead the way for a national mine-safety council soon to be created in state sections by no less an authority than the President of the United States.

C. L. Colburn, of the U. S. Bureau of Mines, proposed that something of the sort be done so as to continue the interest that the St. Louis meeting aroused, and W. D. Ryan, also of the Bureau, actually put the state council idea into words and moved that the words be crystallized into action. And it was done.

The St. Louis meeting gave opportunity for four sessions at which many mine-safety problems of haulage, rescue, explosion prevention, safety training and medical phases of mine care were discussed in competent papers. The discussion ranged from rock dusting and ventilation down to the exact method by which black-damp kills a man, with many features between, including two noon luncheons and a picture show. W. H. Cameron, managing director of the National Safety Council, ran the first day's sessions and Mr. Wilcox those of the second day.

ALTOGETHER TOO MANY HAULAGE ACCIDENTS

Seeing that about 35 per cent of accidents in mines are haulage accidents, some changes ought to be made in haulage methods, Ralph D. Brown, superintendent for the O'Gara Coal Co., told the conference. He recommended first that rolling stock be of a type fitted for

its job and that it be inspected regularly by someone, probably the bottom boss. A proper choice of men for haulage work also is important. Motormen and trip riders should be selected from among men whose youth, activity and sobriety qualify them for the work. Nor should any man ever be put to hauling coal without careful instruction in his job. They should be men who will accept the safety doctrine. And their bosses should set them, and every other man in the mine, an example in safe conduct that cannot be overlooked.

As for making track and roadbed do their bit for safety in haulage, Mr. Brown urged that the old easy-going idea of letting a track take care of itself be

forgotten. Haulageways should be as straight as possible and, of course, level, and should be carefully maintained at all times. Concrete roadbeds under main haulways have proved economical in the mines. Entries ought to be clear of rubbish and the side clearance of the cars should be ample. Mr. Brown would establish and enforce speed limits for trips. Man trips should

never exceed six miles an hour. Storage-battery locomotives are safest for gathering work where cars are not larger than 2½ tons capacity.

Mr. Brown would have every car blocked at the face to prevent its rolling away and would have derails at the lower end of every grade parting. In all mines where there are any grades of consequence he would have a pointed iron drag at the tail of every trip to act as an automatic brake in case the trip gets split. Where mule haulage is used he solemnly recommended that the bosses insist upon good treatment for the mules. "A mule never forgets an insult," said he, "and vengeance is certain."

O'GARA MINES HAVE ONE BOSS TO FIFTY MEN

In the discussion that followed, Mr. Brown declared that the best way in any mine to promote safety is to inculcate the idea by personal enthusiasm on the part of shift bosses. They are the men closest to the employees, and if each boss has no more than 50 men he can give each one some individual attention. That is the O'Gara arrangement, and in addition, the company has two safety inspectors ranging through the mines all the time. Electric lights underground also are important. The O'Gara company has them at every door, switch and curve on the haulageways.

Accidents in mines cost about \$20,000,000 every year in this country, Alexander Miller, of the U. S. Bureau of Mines station in Vincennes, Ind., estimated: of this

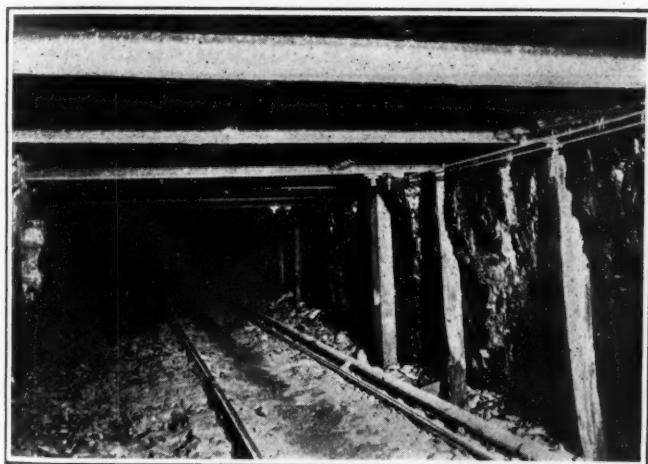
SAFETY ENTHUSIASM AT ST. LOUIS

AALEXANDER MILLER says we know pretty well the causes of accidents and how to prevent them. Now it's merely a case of getting down earnestly to the work of accident prevention. And yet there's always something new to say and learn. The St. Louis meeting proves that, if you need to have it proved.

about \$8,400,000 is assessed against companies for fatalities and \$11,000,000 for non-fatal accidents. But we pretty well know all the causes of accidents and how to prevent them, so now it is merely a case of getting down earnestly to the business of prevention. The best weapon against accidents is personal contact between safety bosses and their men.

Mr. Miller traced the development of safety training and mine-rescue work by the Bureau of Mines from its beginning early in this century, down to the present with its ten mine-rescue and instruction cars and its record of having trained 26,126 men in the use of the self-contained oxygen apparatus. He described minutely what should be done at a mine after an explosion and just how rescue work should proceed.

In the discussion on training men in safety, the point was made that some special little recognition ought to be paid safety men by their companies, if it is no more than giving an annual dinner to those who complete the safety-training course of the Joseph A. Holmes Association. This would make the safety men recognized by every one around the mines. It was suggested that



Appearance of Roadway Before Rockdusting

This same roadway, which is in Indianola mine, is shown on page 46 as it appeared after it had been rockdusted. However, the floor of this roadway as shown here was covered with rock dust when the photograph was taken, for the finest dust from nearby rockdusting was carried by the current and deposited on the floor.

as foremen and mine managers are so important in making a mine crew think safety and as these men so often lose interest in safety work as soon as they pass their necessary examinations, they ought therefore to be required by law to take a safety examination every year.

SO WELL SOLD ON SAFETY THEY STEAL EQUIPMENT

C. F. Anderson, mine manager for the Valier Coal Co., had a puzzle to be solved. Every time his company equipped first-aid stations in the various parts of the mine for emergency use, within one single day, the equipment was all stolen right down to the wooden cabinet and the stretcher. Those were too big to go in a pocket or a dinner bucket. D. D. Wilcox, superintendent of the Superior Coal Co. had an answer. Said he:

"There always will be thieving. We lost as much safety equipment as anybody, so long as it was public property and free of access to anybody in the mine. So now we designate our safety men and post their names and locations on the nearest telephone or section office. When a safety man is called, he goes to his own

individual lock box in the underground hospital where all the first-aid equipment is kept. This makes him personally responsible for his outfit. Periodic inspections of his box also help to make him keep the equipment intact and in good condition."

Rock dusting, of course, was an absorbing topic. The main paper on this subject was one written by Thomas J. Fear, general superintendent of the Inland Collieries Co. of Indianola, Pa. Mr. Fear was not present. In his absence W. D. Keefer, new director of industrial safety, National Safety Council read his paper. His warning that an explosion can be propagated on only three hundredths of an ounce of pulverized coal in suspension per cubic foot of air, brought home to the conference the danger of such coal dust. His recommendations for reducing it got close attention. He recommends rock-dust stemming for shot holes, saying that it reduces the quantity of explosive needed 10 to 30 per cent and increases the proportion of lump coal 10 to 25 per cent.

Mr. Fear recognizes the value of sprinkling in mines and humidifying air, but each is decidedly uncertain in the degree of protection it affords. Therefore, he urges rock dusting. The Bureau of Mines experiments show coal dust to be explosive when it is fine enough to pass through a 20-mesh screen and that rock dust to nullify its inflammability should be not more than 2 per cent combustible and fine enough so that all will pass through a 20-mesh and 50 per cent of it through a 200-mesh screen.

At Indianola the first machine for dusting applied 80 lb. of dust per minute through a 2-in. nozzle at 60-lb. air pressure. It had a stationary Y-shaped outlet which did not secure uniform deposits of the rock dust in cuts, manholes and such places. The machine now used has a 4-in. movable nozzle and a maximum capacity of 10 lb. of dust per minute. The velocity of the rock dust sweeps the lighter coal dust from ribs and roof. This is not deposited on roof and ribs further along but is apparently weighted down by the rock dust and falls to the floor. Such dusting now gains a credit for mines practicing it in Pennsylvania from the state compensation rating bureau.

LESS THAN CENT A TON DUSTS MINE

During the past month in the Indianola mine, 46,000 ft. of entry were dusted with 105,400 lb. of dust, averaging 2.3 lb. per lineal foot. The total cost was \$505.73 or \$0.007 per ton of coal mined. The deduction thus won on insurance costs was about \$0.0015 per ton. Dust cost \$4.40 per ton and handling is charged at 50c. per ton. The cost of this first dusting is \$0.011 per foot, but repeated dustings each three or four months it is estimated will cost between \$0.003 and \$0.004.

Mr. Hayden, of the Cosgrove-Meehan Coal Co., wanted to know how much moisture stone dust in a mine will absorb out of the air current. James Towal, of the E. I. du Pont de Nemours Co., estimated it at 2½ per cent. Superintendent F. F. Green, of the Valier Coal Co., one of the active dusting companies in Illinois, said the natural moisture content in freshly pulverized shale makes it stick to roof and ribs to greater depth than coal dust.

From this the discussion veered off into an argument over the increase in blowout shots in recent years over "the good old days." Some blamed it on poorer supervision of miners but most of the disputants laid it

simply to the greater present-day ignorance of the so-called miner in this country and his unwillingness to snub his cut as required, preferring to blow it all to pieces with overcharges of explosive. Nobody had any remedy for this overcharging except that all loading and shooting of holes should be company work, done by a few skilled men in each mine who can be properly supervised.

The conference lunched in one of the large private dining rooms of the hotel at noon of the first day, and saw the Peabody memorial film, "When a Man's a Miner," shown by the Bureau of Mines. These mining men silently and interestedly watched the full four reels of the story of "Lucky" Burns, detecting but one technical flaw and that a slight one: One of the rescue teams traveled much faster than the prescribed speed in exploration. Otherwise the picture pleased them, though it was freely remarked that the dramatic moments rather missed fire.

In the afternoon session Superintendent Wilcox, of the Superior Coal Co., read a paper on ventilation and dust control. He declared that at many mines a heavy expense from ventilation leaks and improper disposition of air currents is sustained without that fact being realized. He reviewed many of the common causes for those losses, such as sharp turns and sudden restrictions in aircourses which might just as well be removed. In discussing stoppings, he said his company had discarded ash and cement blocks as too porous and now has standardized on concrete blocks, set deeply into roof, ribs and floor.

JUST A LITTLE GUIDING AT FOOT OF DOWNCAST

The volume of air input frequently is 100 per cent in excess of mine requirements yet the men at the faces do not get enough air. There may be too much space allowed—or too little around the top of the downcast, or the cutoff may be in the wrong place, or the air may be required to make too short a turn. At one of his own mines, the right-angled turn where the downcast met the bottom set up eddies of various kinds and greatly reduced the delivery until a V-shaped contrivance was built into the bottom with its apex upward. This forces the air both ways and practically eliminates eddies. Today, in one of the Superior mines 200,000 cu.ft. of air per minute is delivered by an 18x6-ft. fan with a water gage of 0.7 in., the mine spreading more than a mile in each direction.

James Towal, of the E. I. du Pont de Nemours Co., discussing the safe handling of explosives said it is unfair to expect the powder companies to replace steel powder kegs with other material just to keep foolish miners from exploding them by driving in the bungs with picks. If powder got the respect to which it is entitled there would be no such accidents. He laid down a few rules for handling explosives at the face such as: Carry no matches or open lights, load shotholes gently, use electric squibs, tamp shotholes out clear to the face of the coal and shoot one hole at a time with a battery.

RECLOSING CIRCUIT BREAKERS ON SMALL LINES

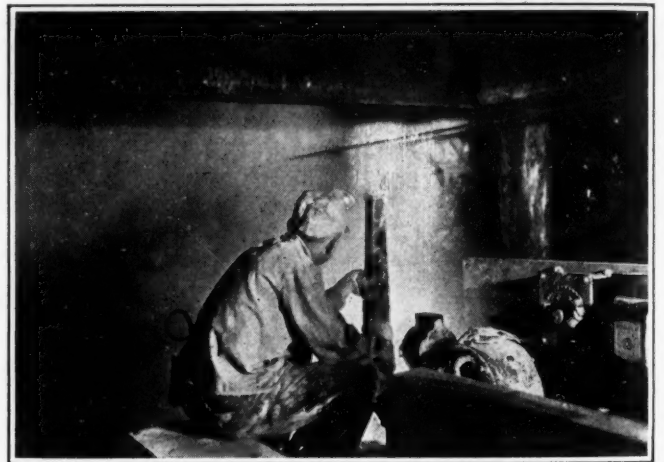
"Six bushels of advice on preventing accidents from electrical equipment," a paper written by L. C. Ilsley, of the Bureau of Mines, was read by E. J. Gleim, of Pittsburgh, Pa. Each "bushel" dealt with one problem such as electric-shock prevention in which he advised grounding the frames of all surface motors, guarding all live or moving parts and leaving ample

clearance around all feeder lines. The other "bushels" dealt with gas ignition, dust ignition, explosives hazard, electric haulage and mine-fire preventions. Mr. Ilsley's paper drew some fire by stating that automatic reclosing circuit breakers are safe only on main lines and not on small feeder lines. Mr. Gleim said he thinks Mr. Ilsley believes there is danger of such a breaker closing when the "short" is brief and less than a certain load.

MINERS THINK SAFETY THE OPERATOR'S FAD

The essential work of reaching the miners with the safety doctrine can be done better by the Bureau of Mines through its Joseph A. Holmes Mine Safety Associations than by the National Safety Council which called the St. Louis conference, W. D. Ryan declared. He is a Bureau of Mines safety commissioner but he insisted there was no animus against the National in his words. He merely insisted that the National has not the equipment nor the talent to do the bedrock work among miners. So he urged close co-operation between the National and the Bureau, each doing its own special service.

"There ought to be some miners here at this meeting," said he. "They are the men about whom we are



Laying the Dust on Thick with Projector

Scene in Indianola Mine, of Inland Collieries Co. There is a certain distance at which the nozzle of the projecting equipment should be held to get the best results.

talking. They are the fellows over whose safety we are worrying. They should be given prominent places upon this program instead of putting on four Bureau men as was done."

It was replied that all Holmes chapters in Illinois and President Frank Farrington of the Illinois miners had been invited and that Vice-President Harry Fishwick had tentatively accepted because of Farrington's illness; but Mr. Ryan reported talking to Fishwick only the night before in St. Louis, and Fishwick had said he wasn't coming.

"Then it's the miners' own fault," said J. S. Anderson. "They evidently were invited and they apparently regard the meeting as something the operators have concocted and which, therefore, should be scorned." He complained that this attitude of the union is what makes it hard to train safety men. When a Bureau car comes into a mining town in Illinois to conduct classes, only 15 or 20 out of possibly 800 union men attend, and these do it rather warily because they are liable to be suspected by the union as trying to curry favor with the company. In any event miners listen more readily

to the orders of the union than to those of their employers.

Mr. Ryan, in his address, "What the Joseph A. Holmes Safety Association is Doing For Accident Prevention," stated that in spite of the financial losses of \$20,000,000 or more annually to coal operators through accidents, many operators will not help in the safety work. One in Montana even refused to pay a safety-trained miner for a day he lost taking care of a buddy hurt in the mine, who otherwise would have died at heavy compensation cost to the company. This sort of refusal to co-operate is one of the obstacles in the way of safety.

However, Mr. Ryan also had some cases of the union refusal. He cited the Oklahoma case where the district union organization of "bolsheviks" stands by State Inspector Boyle, in opposition to the introduction of safe electric cap lamps in Oklahoma.

MINER IS NOT BEYOND ARGUMENT

He took issue with declarations of others that it is no use trying to educate the miner in safety. He insisted it can be done if it is tried right, for the American miner is not the ignorant roughneck he is often pictured. In 1920 it was found that 88 per cent were literate and only 30 per cent foreign born. Of these foreign born four-fifths had been in this country 10 years or more. Safety education will reach them and 75 per cent of accidents can be eliminated. He made some safety suggestions. Here they are: Use closed lights in all gaseous mines. All drilling, loading and shooting in order to reduce blown out shots should be performed by company men. No mine examiner should be allowed to use a safety lamp he can unlock. If that had been done the Hastings and Kemmerer disasters and many other explosions could have been avoided. Every miner should be required to test the roof of his place every morning before anything else is done. Permissibles should be required in all mines where there is reason at all to use them. Joseph A. Holmes chapters should be installed in every mining camp.

After hearing some bitter complaints that the Holmes chapters so often die or suffer dry rot, James Boston, safety man for the Superior Coal Co., Gillespie, Ill., laid his cob pipe on the edge of the speaker's table and said the chapter was working fine in Gillespie and he'd tell the world why. It's got to be that way anywhere if safety is going to amount to anything. The company does its part by supplying all the necessary equipment, by seeing to it no miner loses pay for time he spends in safety work and by otherwise meeting the men half way. The men are stimulated to work at this safety business and they do it. Hence there are mighty few accidents at Gillespie.

But before Boston picked up his cob pipe again, he flayed the operators of the country for not supporting safety work. Through somebody's neglect or refusal to put up money, the Huntington national first-aid contest was called off. The union didn't cancel it nor yet the Holmes associations. Someone else did. The same thing happened to the Illinois state meet to have been held at Belleville and this made the Holmes chapter at Gillespie so incensed that it is going to put on the state meet next fall under its own auspices and has raised most of the money already from union organizations and individuals.

There were some queries as to just what the Joseph

A. Holmes Mine Safety Association is, anyway, and how to organize chapters. So C. L. Colburn traced its history since it was started under the protective wing of the Bureau of Mines in 1916 as a memorial to the first director of the Bureau in place of erecting a cold monument in Washington. Some twenty-four organizations besides the Bureau joined in forming it. There are now ninety-six chapters in mining towns, about sixty of them virile.

HOW ASSOCIATION WORK IS FOSTERED

Any operator or union local can organize one among any group of miners and get the assistance of the headquarters in Pittsburgh, Pa. In Illinois the state department of mines and minerals or any state inspector will help. Dues of from \$10 to \$50 a year, depending upon the size of the chapter, are paid by each chapter, none of which is spent for salaries or traveling expenses by any of the national officers or directors—a list which includes the Director of the Bureau as president, and officials of the National Safety Council, the United Mine Workers and other organizations. The headquarters issue buttons to all members, many safety bulletins and instructions, sends out speakers and otherwise fosters the work of the chapters. It is now broadcasting safety talks by radio from Pittsburgh.

Mr. Colburn said safety is like a business: When it is properly directed it pays. Dividends go not to stockholders alone but to companies, employees, their dependents and everybody else who is interested. Of course accidents produce compensation in money to men who get hurt, but does money pay for the lost arms and legs and eyes? How much finer humanitarianism it is to save those arms and legs and eyes by safety practice!

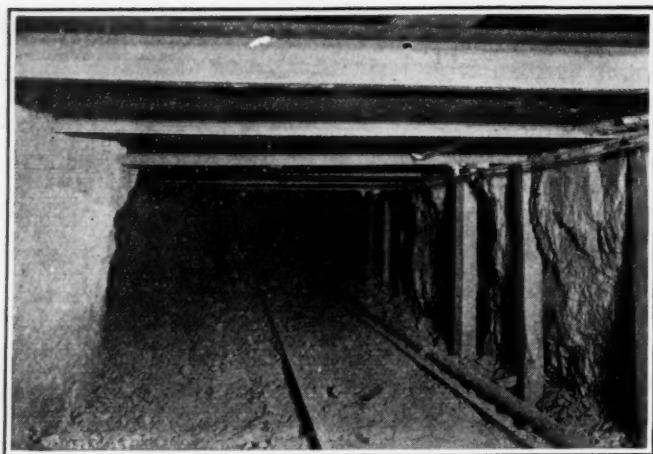
To really practice it, he said, not only must a mine property be made physically as safe as possible and equipped with the necessary safeguards, but, more important still, company officials must be enthusiastic about safety and preach it by word and deed, and employees must keep up an aroused interest even after they have been instructed in safe practice. This usually can be done by giving them active parts to play in some phase of safety work or in the Holmes Chapter's activities. It was here that Mr. Colburn proposed the Illinois state safety council, the plan for which was started before the conference adjourned.

OXYGEN FILTERS INTO HEMOGLOBIN

Just what do mine gases do to the human body? How is it that they kill? In A.B.C. fashion and most interestingly Dr. H. G. Bristow, professor of chemistry at St. Louis University, talked about this subject, referring especially to common mine gases such as carbon dioxide and carbon monoxide.

He began by explaining that a man inhales air in order to deliver oxygen into the blood stream where it is carried in chemical combination with the hemoglobin or red matter in the blood corpuscles. In the lung tissue it filters into the hemoglobin much as water at different levels, separated by a finely perforated partition, would run from the high-level side into the low until equilibrium is attained.

So long as the blood coming into the lungs is low in oxygen, the oxygen from the air will continue to be absorbed. Then the blood carries it to the tissues of the body structure where the oxygen content is low and the carbon dioxide (caused by muscular effort)



A Dust-Coated Mine Haulageway

This is the roadway shown in the illustration on page 43. Only the form of the coal surfaces remain after rockdusting. The coal is so covered with limestone dust that it looks just like rock. A drill or a pick almost would be needed to convince one that the coal thus disguised was coal and not rock. Yet the coating can be rubbed off readily by the hand and is so loose that a blast would not fail to dislodge it.

is high. Here the carbon dioxide runs into the blood and oxygen into the muscles until equilibrium is attained again. Thus the process goes steadily on so long as the air a man breathes has an oxygen content of at least 12 per cent. It normally is about 20 per cent.

But if the man's a miner and runs into carbon dioxide in the mine, the air he breathes may have less than 12 per cent of oxygen. Then it cannot deliver oxygen into the blood. There is so much carbon dioxide present that his lung air cannot remove from the body the carbon dioxide the blood has brought in. The result is suffocation in short order.

If the man is resuscitated, however, his recovery is rapid, for the lungs contain no less than 100 sq.yd. of contact surface for the passage of oxygen and carbon dioxide between blood and breath and a large volume of both can be transferred within a few minutes. Normally a man inhales 1,200 quarts of oxygen and exhales 100 quarts of carbon dioxide in a day of average activity.

The other gas, carbon monoxide is more dangerous than carbon dioxide because, when it filters into the blood it forms an absolute chemical union with the hemoglobin of the blood and is not unloaded at the other end of the line. It remains in combination, thus effectively putting the red corpuscles out of business. They can neither carry in oxygen nor carry out the gas of worn-out body tissue.

The hemoglobin absorbs carbon monoxide 300 times as readily as it does life-giving oxygen, so that a trace in the lungs soon saturates all the red corpuscles in the blood, even though there may be much oxygen present. As little as six parts of carbon monoxide in 10,000 parts of air makes a man drowsy in half an hour and 50 in 10,000 produces unconsciousness in that time. Higher proportions such as are encountered after mine explosions kill a man in a few breaths.

JUST SUFFOCATED BY GAS, NOT POISONED

"However, these gases are not poisonous," said the doctor. "It is a common fallacy to think so. They kill merely by the mechanical action of preventing the body from getting rid of its own waste matter through the breath. A man is not poisoned to death by them at all. He is just suffocated. After resuscitation he is left without any detrimental after-effects.

"There are only a few poison gases made in mines. About the only one ever encountered, is what the miner calls 'stink damp.' It is a combination of hydrogen called hydrogen sulphide and certainly is well named a 'stink' gas. It advertises its presence so well and is in such small concentration in the air that a man is almost always able to get away from it. Also it acts slowly although poisonous, and altogether is no menace at all compared to the non-poisonous gases."

ANIMALS IN MINES CAUSE INFECTION OF WOUNDS

It was remarkable how much interest Dr. J. B. Moore, of Benton, Ill., could arouse in the subject of "Infections from Wounds." After considerable experience in the heart of the southern Illinois coal field he declared that it is fallacious to believe that the sulphur in mine water in any way promotes infection. As a matter of fact sulphur is an antiseptic. Mine water is by no means as poisonous as many mining men think. Even water in a long abandoned mine ought not to be infectious even though timbers may have decayed and fermented because there are few harmful bacteria in wood and many helpful kinds. It is usually animal matter that makes mine water dangerous. Animals in mines always add to the likelihood of infections in men's cuts and injuries. Thus the motor-haulage mine is safer in this particular than the mine in which the mule is used.

Dr. Moore had much to say about the value to a miner of clean clothes next his skin, though the outer garments may be filthy. He condemned the use of any sort of soiled cloth for temporary dressing of wounds or slight skin injuries. The mine bathhouse makes the skin of today's miner far cleaner than that of the miner of long ago and thus greatly reduces many health hazards.

A discussion of eye injuries and first-aid treatment roused almost the whole conference to speech. The doctor said any man who gets even a slight eye injury should drop his work and go to a doctor at once for infections can set in within a few hours. Many a good eye has been sacrificed because a buddy attempts in all kindness to remove some foreign matter from a miner's eye with the corner of a dirty handkerchief. M. L. Felmer said southern Illinois coal, for some reason as yet unknown, seems to have a peculiar power to infect eyes.

FIRST-AID MEN SHOULD NOT TREAT EYES

James Boston remarked that at Gillespie good first-aid work appears to reduce trouble from eye accidents. This roused Dr. Moore who is absolutely opposed to the first-aid men at mines treating slight eye injuries. There is too great danger of the patient regarding such temporary treatment as permanent. Many unsuspected infections have developed from such treatment and run into dangerous stages before a doctor ever sees them. Too often mine first-aid kits become contaminated from improper care. This is one reason why the local doctor often is blamed for failures to save eyes that he treats. After an ulcer gets a foothold even a specialist seldom can restore the eye without blemish and often cannot save the sight. Such ulcers can develop overnight. Therefore, Dr. Moore said, no man ought ever to go to bed with any eye injury untreated by a competent physician.

The conference ended late in the afternoon of June 26, its second day.

What Does the Power That We Needlessly Waste Cost Us?

Abuse of Electric Service Frequently Costs More Than Its Use—Most Abuses Corrected by Actual Meter Readings

BY CHARLES A. SWARTZ
Springfield, Ill.

AT A LARGE number of mining operations, where most of the houses are occupied by mine workers or salaried employees, it has been the practice to supply—either without charge or else on a flat-rate basis—the electric energy used for light and other purposes in these houses. With no check imposed on the use of the service, the shiftless and irresponsible elements of the communities naturally let the electric lights burn without regard to their proper use or to company interests.

Where electric service was supplied free, the whole burden of such extravagance was borne by the owning company. But where the flat-rate system prevailed, waste of current, by increasing the expense to which the company was put for supplying the service, compelled an increase in the flat rate charged. This increase naturally had to be borne by the better element in the community as well as by those whose wastefulness brought it about.

The inequity of such a system became apparent to the management of many mining companies and has resulted in the introduction of the system which experience in the general industry of supplying electric light and power to the public has proven to be the only just and practicable method of creating true service economy. This is the system of measuring the energy supplied to each separate customer and basing the charges made to him on the individual energy consumption indicated by periodical meter readings.

GENERAL SOCIAL ADVANCE FOSTERS METERING

The introduction of this system of metering the electric energy supplied to the homes of miners and other workers living in communities where the furnishing of electric light and power is a service performed by the chief local industrial plant, has, in a measure, been accelerated not only by progress in plant management but by the general social progress of the entire country. As has been outlined the principal factor in making the system of supplying electric energy gratis and unrestricted, or of furnishing it on a flat-rate basis, too expensive to continue, was the shiftless habits of some of the people in the communities served. The effect of such extravagance was, of course, mitigated by the economy in electric service characteristic of the better class of the community. However, with the increasing development and adoption of electric flat-irons, washing machines and all manner of electric household appliances, this better element—because of superior industry, thrift and self-respect—aspired to the use of these devices and began rapidly to increase its average consumption of electric energy. Consequently, such aspirations, though laudable, added substantially to the burden borne by the employing industry supplying the free or flat-rate electric service.

Because of these conditions, as has been stated, numerous progressive coal-mining companies have installed watt-hour meters in their company houses.

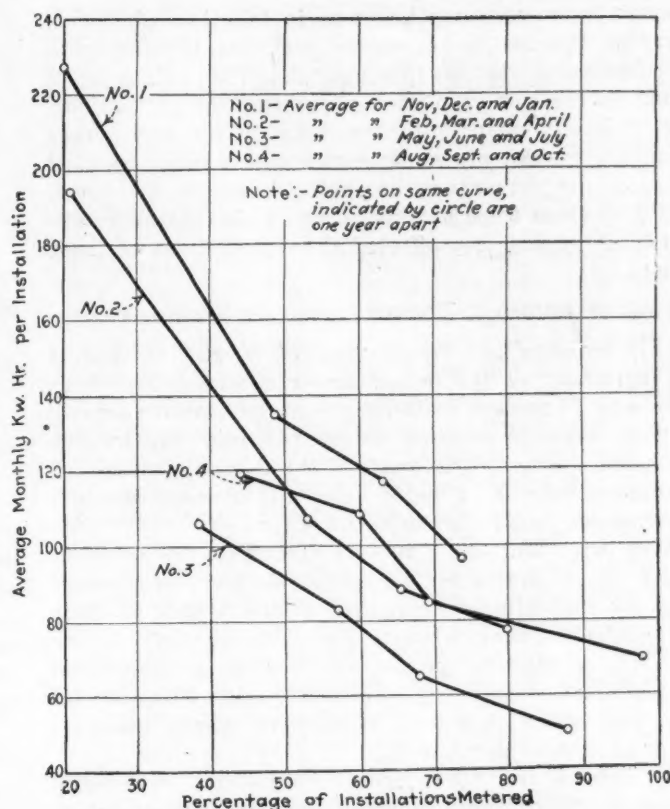


Fig. 1—Curves Showing Waste Reduction

This shows how rapidly the needless waste of electric current decreases when the quantity actually consumed is once known. So long as anyone receives current gratis or on a flat rate there is small incentive to save "juice."

Many interesting results followed. For instance, one superintendent who had been paying a flat rate of \$1.50 per month found himself presented with a bill for \$18, based on a nominal charge for energy shown to have been actually consumed during the first month after his meter had been installed. As may be imagined reasonable economy in the use of electricity in his household quickly came about after this mine official had paid his first bill.

Whether the excessive use of free electric service by such officials arises from an indifference comparable to the shiftlessness of a certain type of miners, or from a feeling on the part of the former that unlimited use of such service is a perquisite properly appertaining to their position, such instances establish the fact that watt-hour meters can be quite properly placed on the premises of all classes of mine employees. The extent to which extravagant use of electric energy declines on installation of electric meters is illustrated by the fact that one company, after being forced by such extravagance to install these instruments found that after such installation 15 per cent of the users did not consume enough electricity, figured at 8c. per kilowatt-hour, even to equal the company's minimum charge of 75c. per month.

Further details of the workings of meter installation toward a reduction of waste is illustrated by the accompanying curves. The company from whose records these curves were made was active in both manufacturing and coal mining in a certain town. As it owned the principal local industries, it supplied electricity on a flat-rate basis to all the houses in the community.

It was decided to install watt-hour meters. The placing of these instruments extended over a period of three years. In Fig. 1, the curves plotted show average

kilowatt-hour consumption per installation at corresponding periods in successive years as the metering of consumers' circuits progressed. The points upon which each curve is plotted represents yearly periods. Fig. 2 is a composite of the four curves and makes evident the trend of energy consumption per connected user, as the percentage of metered houses increased. The downward slope of this curve is significantly indicative of the economy effected through the use of these meters.

METERING ALL HOUSES INCREASES ECONOMY

This economy can be summarized by stating that at the beginning of the period under consideration there were only 76 meters installed among 382 houses served, with an average monthly consumption of 220 kw.-hr. per house. After three years, 709 out of a total of 712 consumers were on a meter basis and average monthly consumption had fallen to 62 kw.-hr.

Even with watt-hour meters installed, the determination of an equitable charge for electric energy supplied by coal-mining companies to the homes of their workers is not always easy. For instance, there is the problem of floating population. Some mining companies install meters only in houses occupied by salaried men, and other classes of consumers whose interests are regarded as permanent.

By subtracting the aggregate quantity of energy passing through these meters from the total output of current shown by the totalizing meter registering the energy supplied outside the company plant, the quantity of current furnished the miners is determined. A charge is made in proportion to this total quantity of energy, the charge being divided among the whole body of miners.

As an inducement to economy, a charge for service is made to the metered consumers only when the energy used passes a certain figure. As a result, power consumption is kept within close bounds. For a consumer in this class to run over the quantity given free

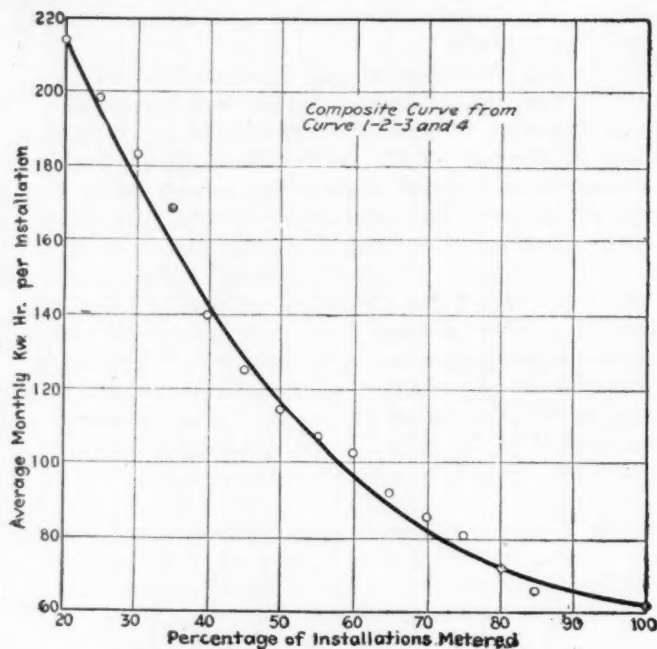


Fig. 2—Curves of Fig. 1 Combined

With no yardstick to serve as a measure anyone may consider that he is saving in his use of electric current when, as a matter of fact, he may be highly extravagant. Installation of a watt-hour meter immediately furnishes the householder with a means for comparing his current consumption from month to month and enables him to judge for himself whether he is frugal or extravagant.

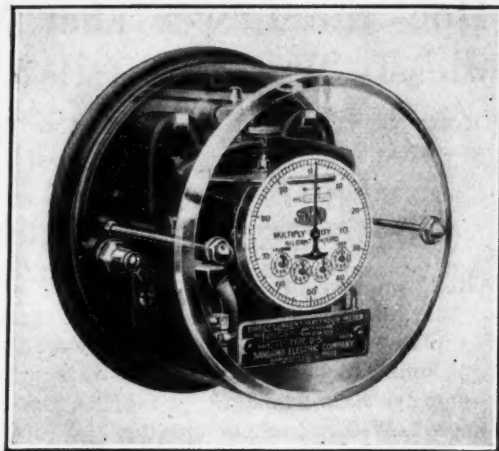


Fig. 3—Direct-Current Watt-hour Meter

It is useless and illogical to demand economy in power production and permit unchecked extravagance in its use. Installation of an instrument such as this in the supply line or power circuit prevents "saving at the spigot and wasting at the bung-hole," as electric current too often is handled at mining plants.

is exceptional. It is estimated that the power consumption among this class is now hardly half what it was before the installation of meters.

In order to drive home to the miners the need of economy in the use of electric current in their unmetered houses, the flat rate was increased 60 per cent. The miners were told that the new rate would be reduced as soon as they became more economical of the service. Up to the present time, however, no evidence of such economy has become apparent.

Apropos of economy in the use of electric energy in the homes of company employees, it seems rather inconsistent to insist upon such frugality without taking effective steps to accomplish similar savings in the company's plant itself. Power costs in coal mining are appreciable, and the proper use of watt-hour meters can effect substantial savings whether the energy used is purchased from a central station, or generated at the mine.

It is of little use to require the plant engineer to make power from bone coal or "dirt and dust," in order to save marketable fuel for sale, if the economy thus effected is offset by waste of the power generated. It is of little use to install carbon-dioxide recorders and other up-to-date boiler-room instruments for checking up economy in power production, unless suitable instruments are also employed for checking power consumed.

Some of the places where power may be wasted are the haulage circuit, the breaker or tippie drive, the ventilating fans, the coal cutters, the air compressors, the electric mine pumps, and the like. If power is purchased, it is certain that the central station company supplying that power has a meter on the feeder through which energy is transmitted to the mining plant. It is, therefore, equally as important that the mine operator should have his own meter on his end of the feeder so that he can check up intelligently the power bills his company must pay. If the bills show that his company is being charged for more electric energy than the watt-hour meter indicates was consumed by his plant, there is obviously a difference between the meter on his end of the line and that installed by the power company. When such differences occur, both meters should be tested and the trouble rectified.

In order to determine the cost of the various mine

operations, the cost of power consumed in them must be charged into the total figure. Unless watt-hour meters are installed on the various circuits supplying such power, it is impossible accurately and conveniently to determine these power costs. Neither is it possible, without such meters, to check up and detect power wastes that may cause appreciable losses.

In this connection, note the extensive employment of watt-hour meters on street cars. Such meters so installed provide a continuous record of operating economy. By simply dividing the power consumed by the mileage multiplied by the load, the efficiency of both car and driver can be easily determined. Knowing that such a check is placed on their work, motormen are more careful than they would otherwise be. It is estimated that from 10 to 20 per cent saving in power is thus effected in street-car operation.

The same principles apply to the operation of electric mine locomotives. Progressive mining companies are already demonstrating that similar economy can be affected in the department of mine transportation.

Still another advance toward power economy obtainable from the use of watt-hour meters on mine locomotives can be gained by installing a totalizing watt-hour meter on the main haulage-circuit feeder. By subtracting the aggregate energy consumption of the locomotives from the total energy supplied the haulage circuit, as shown by the haulage-feeder meter, any excessive absorption of energy by reason of poor rail bonds, feeders of insufficient cross-section or equipment in poor condition, becomes immediately apparent.

Thus, motorman efficiency, locomotive efficiency and the general efficiency of the entire haulage system are at once collectively and individually indicated by the data afforded through the use of these various meters.

Similarly, watt-hour meters on light and power circuits in and around the coal mines can be made to yield substantial dividends on a moderate investment. There are, of course, various types of such meters respectively adapted to the different conditions encountered. The manufacturers are in a position to effectively co-operate with mine operators and engineers interested in such installations.

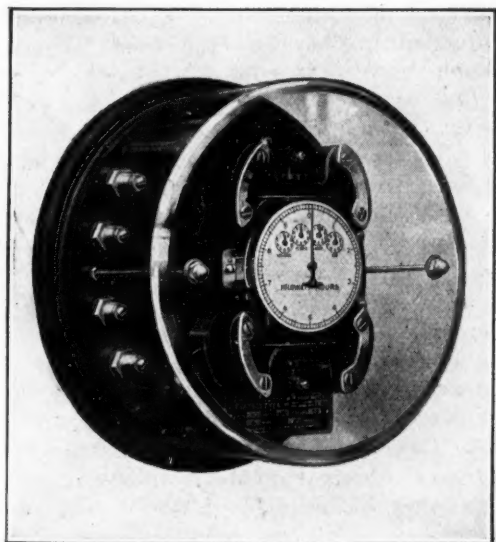


Fig. 4—Alternating-Current Watt-hour Meter

This is a polyphase instrument intended for mounting on a switchboard. It may be used to measure either the output of a plant or the input to any particular line. Actual costs of any process of mining must remain unknown until definite records can be had of the power consumed in that particular process.

The Miner's Torch

When the Big Boss Goes a Visiting

THE president of a large coal mining company gave me an invitation today to accompany him on an inspection trip covering all of his mining camps and I declined with thanks. Whenever I get invitations of that kind I recall the heart aches and the disappointments brought to me and mine back in the days when I was a mining superintendent and our president, or general manager, and his friends honored our camp with such a visit. Me and mine includes not only my men but my wife and children as well.

The first ordeal of that kind that I recall came early in my married life. We had received notice from the general office that our president and some of our directors would honor us with their presence on a certain day about two weeks later. That night I broke the news to my wife and from that moment she was the busiest person in the camp.

We had a pretty fair house, as mining-camp houses go, but my wife had never been in mining camps previous to our marriage and she knew that our house and its furnishings would not reflect credit on her when inspected by the average city folk. Furthermore, our daily menu, dependent as it was on commissary variety, would hardly cause visitors from a city to wax enthusiastic about our eating; my wife reasoned that her only chance to make an impression was through her housekeeping or her cooking, so our commissary manager had to make several special trips to town for provisions before he satisfied my wife. Of course, it was useless for me to argue that she was taking the thing altogether too seriously; she had found out that I was moving heaven and earth to have the general appearance of the camp improved, and had instructed every mechanic on the job to get busy cleaning machinery.

I have had charge of quite a number of different operations in my day but I have never succeeded in getting one more nearly ship-shape than was that plant when the day for inspection arrived. And what was the reward?

While the crowd was standing at the slope mouth waiting for a trip of cars to come to daylight, a perfectly good wooden roller decided to stop turning and before the trip reached the outside the rope had worn a groove in the roller and yanked it out. Not one of the party noticed the rope or the roller until the roller was lying outside of the track and the rope was sawing grooves in the wooden ties and striking fire on the ballast. I am sure that that one little missing roller made more of an impression than anything that the visitors saw while inspecting the plant.

And what about the wife? The visitors came out in a private car and preferred to have their own chef serve lunch because, as one of them expressed it, a change of food and especially water is always risky. Not one of the visitors met my wife nor suggested that she come over to the car for the noon luncheon they had while the car was on our camp siding. Perhaps they didn't know I had a wife.

Competition of Oil with Coal for Fuel Purposes Begins to Lose Its Edge

Increasing Price Taking Away Principal Advantage—Uncertainty of Supply Menaces Future of the Industry—High Operating Efficiency and Absence of Ashes Counterbalanced by Wear and Tear on Boilers

OIL IS losing the advantage in price it once had in competition with coal and its supply is by no means as sure as that of coal in this country. For these reasons Borden Covell, president of the Northern Coal Co., of Boston, sees a weakening of oil as a competitor of coal in New England and elsewhere. He reviewed the matter before the American Wholesale Coal Association convention in June.

Six or seven years ago, he said, oil came in strong against coal, mainly because oil salesmen could convince buyers of heating equipment that oil would cost them 10 per cent less than coal and that they could save the entire cost of their oil-burning equipment during the life of their very first oil contract. In the thickly settled and manufacturing districts there is enough labor trouble to make coal firing often troublesome. This, too, helped the oil man. The high coal prices of 1920 made the oil buyer feel justified in the belief that he had done the right thing when he shifted to oil. But conditions have changed. The coal man has the advantage today.

Owners of plants who think of changing from coal to oil today should make haste very slowly, in Mr. Covell's opinion. Even if the price of oil is as low as coal now, what will it be on the next contract? And how long will plenty of oil of the right quality be available?

OILS OF MANY SPECIFIC GRAVITIES RECEIVED

"Approximately 725 billion barrels of fuel oil," said Mr. Covell, "are produced annually. Mexico contributes 25 per cent of this. Crude oil as produced in Mexico carries too low a flash point to permit its use generally. Therefore the oil is topped—that is, a small percentage of gasoline and other light oils is distilled to save the oil and produce a fuel which will flash at not less than 150 deg. This residue runs 14 to 16 deg. Baumé and will average 18,400 B.t.u. per pound. It is well to add right here that whereas in the early stages of the game oil ran uniformly, it is now quite the opposite. There are so many grades of oil coming into the market that a plant now using oil for fuel must figure on receiving oil of different specific gravities, just the same as it received different grades of coal.

"In order to give some figures on cost, we will assume as a standard coal showing 14,250 B.t.u. as received. Fuel oil is sold by the barrel. To reduce that fuel to weight, let us figure 18,400 B.t.u. per pound, 8 lb. to the gallon, 42 gal. to the barrel. These figures give 31,920,000 B.t.u. per gross ton of coal, and 6,180,000 B.t.u. per barrel of fuel oil. One gross ton of bituminous coal will be equal to 5.17 bbl. of oil on a heating-value basis, *regardless of efficiency*. In some sections steam sizes of anthracite coal are sold in competition with bituminous coal. Therefore, figuring 11,500 B.t.u. per pound for this class of fuel gives us 25,760,000

B.t.u. per gross ton, or equal to 4.17 bbl. of oil on a heating-value basis, regardless of efficiency.

"The percentage of efficiency is of paramount importance. Comparing oil as against the various types of coal, we find:

	Operating Efficiency	Barrels of Oil Equivalent to Tons of Coal
Hand firing.....	63%	4.23
Stoker firing.....	75%	4.96
Pulverized coal.....	80%	5.36
Steam sized anthracite.....	68%	3.68

"Cost of changing over from coal to oil is important. Hand-fired plants usually are small and therefore not attractive to the oil man. Stoker plants, depending on how elaborate, cost from \$16 to \$25 per horsepower. The cost of installing oil as a fuel depends largely on the size of storage required, ease of installation—regulations are very strict on this—resetting of old boilers, or the installation of new ones. Conditions vary, so that the cost runs from \$15 to \$40 per horsepower.

EAST USES MEXICAN OIL, SOUTH-WEST AMERICAN

"The oil used for steam production in the East is essentially Mexican oil, while that used in St. Louis, Chicago and the Southwest is what might be called American fuel oil. The Mexican is a good deal heavier and conditions of feeding it into furnaces are quite different from those when American fuel oil is used. For instance, some years ago a large plant in Rhode Island ran short of its regular fuel oil and the contractors shipped to it quite a bit of American fuel oil. The plant's apparatus was lined up to use the heavy oil with a steam pressure for putting it into the furnaces considerably higher than is necessary in using the lighter oils. Therefore the waste sustained was considerable.

"The first contract made on fuel oil in New England was in the autumn of 1915 on the basis of 85c. a barrel f.o.b. cars tidewater point New England, for a term of five years. Assuming 4½ barrels of oil per ton of high-grade coal, this was equal to coal at \$3.61 f.o.b. cars shipping point.

NOWADAYS MUST PAY MARKET PRICE FOR OIL

"When fuel oil was first introduced, contracts could be made at a fixed price for a term of years; today it is customary to base the price on the price of bunker oil f.o.b. New York as quoted daily in the *New York Journal of Commerce*. Today the price quoted is \$1.75 per barrel. Prices in Providence, Boston and Portland are 10c. a barrel higher. Therefore, if you order today, say, 10,000 bbl. of oil, the price is based on the quotation that you read in the *New York Journal of Commerce* as of that day, plus the differential charged at the various distributing points in New England, or say \$1.85 Boston. Using 4½ bbl. as equivalent to a ton of coal, this means coal at \$7.86 f.o.b. Boston. We are

asking \$5.75 f.o.b. cars Boston for high-grade West Virginia smokeless coal, or a difference of \$2.11 a ton in favor of coal.

"I have a few comparative costs of the typical New England mill burning around 10,000 tons of coal a year. An engineer went into this plant, studied the conditions as he found them, and reported to the owners that coal and oil bore the following relation in cost: Coal at \$6 per ton equals oil at \$1.58 per barrel; coal at \$7 equals oil at \$1.80; coal at \$8 equals oil at \$2.02; coal at \$9 equals oil at \$2.24; coal at \$10 equals oil at \$2.47.

"We will assume for comparison that coal today would cost this plant \$7 in its bins; therefore, it would have to buy oil at \$1.80 per barrel delivered, whereas the cost today is \$1.85 f.o.b. Boston and there is a freight rate of 25c. a barrel. In other words it could pay between \$8 and \$9 for coal and be on an equal footing with oil.

Now Coal Is 30 PER CENT CHEAPER THAN OIL

"In the last five years it would seem as if there was less spread between the contract and spot prices of oil than of coal; so in this comparison oil is favored. However, during that time there were two periods when coal was difficult to obtain and consequently prices were high. On the other hand, there were two periods of overproduction in oil and prices consequently fell. A comparison of figures shows fuel oil today at \$1.75, New York Harbor, and high-grade coal at \$5.25@5.50 per gross ton at the piers, with, I fear, a tendency downward. On the basis of 4½ bbl. of oil to a ton of coal, we find oil costing \$7.43. This means coal is approximately 30 per cent cheaper than oil.

"In a manufacturing plant the value of fuel as it is delivered is not so important as the cost per 1,000 lb. of steam leaving the boiler room. Each plant has its own particular conditions and therefore study is required before proper decision can be made. It behooves the concern studying its present costs with coal as fuel against those submitted by engineers for the oil people to see first if he cannot improve the conditions under which he is burning coal without going into any heavy expenditure.

"The points usually stressed by the proponents of fuel oil are: That oil has higher efficiency, makes no ashes, is of higher capacity and can be fired with fewer labor charges.

OIL NOT ANY MORE EFFICIENT FUEL THAN COAL

"As to the question of efficiency it is a fact that there is little difference between a modern stoker layout and oil-fired furnaces. The error of excess air is more difficult to detect in oil combustion than in coal, thus tending to fuel waste.

"It is true oil makes no ashes, but to offset this is the residue deposited on the heating surfaces of the boiler—a deposit oily, hard to remove and highly non-conductive as to heat. Greater care is necessary in removing this deposit than is needed in blowing off the dust from ashes. In many localities today the demand for ashes, due to construction work, is so great that the cost of handling them is taken care of by those who are willing to buy them; in fact in some plants a little money is made.

"Undoubtedly the capacity is in favor of oil in plants of comparable efficiency, but this excessive forcing has ruined many boilers. The contact of the fuel-oil flame

has often cracked and burned parts of the combustion chambers.

"In hand-fired plants of a size requiring employment of many men, the labor cost is certainly higher in firing coal than in burning oil. However, modern stoker installation under average conditions existing today requires very little in additional labor costs, for under proper conditions mechanical stokers need but one fireman and one water tender for every 5,000-hp. of boilers. It is impossible for a plant equipped with fuel oil to get along with a lesser number. The labor of tending to the water levels in either installation is the same and stokers do not require any more adjustment than do the oil burners.

"We in New England have been particularly hard hit by fuel oil. Conservative estimates place the loss in coal consumption due to replacement by fuel oil at between four and a half and five million tons per year. Today the tide is beginning to flow our way and we expect to see by far the larger portion of our old customers back with us again in the next four or five years.

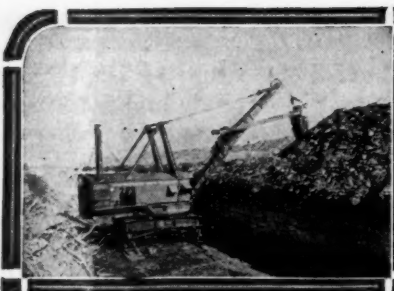
"The improvements each year in getting higher gasoline yields from oils make the refining process more attractive and consequently lessen the amount of fuel oil available for steam purposes.

OIL MAN DOESN'T WANT WINTER DELIVERIES

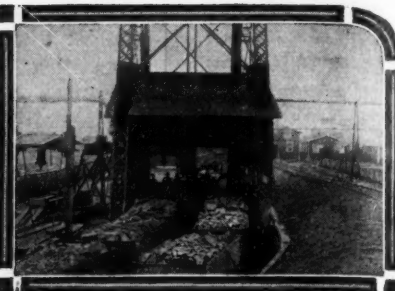
"Oil heating for homes has increased tremendously throughout the country, due primarily to the usual reasons—cost, scarcity and high prices. The campaign is being made almost entirely by the oil-heater man. He confines his energies to territories near the large storage centers and usually discourages the use of oil where it may be difficult to make deliveries during the winter months. Generally there is no saving in using house oil and in many cases it costs more than coal. It is attractive because there are no ashes and cellars are clean, but there is an objectionable noise and the fire risk is great. Many disastrous fires have occurred during the past winter and some fatal explosions, and we have innumerable instances of soot and oil smells invading the upper stories. We all know of instances where householders have returned to coal, but, generally speaking, this new form of heating houses will increase as better burners are put on the market. I think the use of oil for heating is in its infancy."

Paint Protects Concentrating Tables From Acid and Attrition

The highest upkeep item, chargeable to concentrator-table operation in anthracite breakers, is for covers and riffles. The acid water and the abrasive action of the coal tend to shorten the useful life of the covers and of the maple riffles which are nailed to them. It has been found practicable to coat the operating surface of the tables with high-grade resisting paint. In this way the life of the linoleum and wood is profitably prolonged. In the lead and zinc field concrete is being used for the table "cover." It has been used also by the Utah Copper Co., and still may be in use for that purpose. The lead and zinc companies are using rubber riffles, the Utah Copper Co. and Replogle Steel Co., however, pressing iron into that service. The first of these companies is cleaning copper ore and the second iron ore.



News Of the Industry



Storage Essential to Solution of Nation's Coal Problem, Says Engineers' Report

Committee of American Engineering Council Declares It Will Eliminate Danger of Fuel Famine, Stabilize Industry, Relieve Railroads and Ultimately Cut Consumer's Coal Bill

Storage of coal is essentially necessary as an aid to the solution of the national coal problem, the Storage of Coal Committee of the American Engineering Council declares in its report; will eliminate all danger of coal famine, stabilize industry, relieve the railroads and ultimately cut the consumer's coal bill.

The report of the committee, which was made public on July 7, sets forth that if each coal consumer will adopt the policy of annually purchasing coal on a uniform monthly delivery basis it will automatically result in sufficient seasonal storage to guarantee coal to the consumer as needed and will bring about a uniform demand for coal whereby the coal producer and carrier may establish uniform and standard production and shipment schedules.

Cites Hard-Coal Precedent

Confirmation of the practicability of coal storage is afforded by the anthracite industry, says the committee, which is far more stable than the bituminous, because producers, carriers and consumers of hard coal for a number of years have alike encouraged and practiced storage.

"The storage of coal also will remove the evils of intermittent operation of coal mines, frequent panicky market conditions, and coal shortages due to inability of the carriers to meet peak demand," declares the report.

The irregularity in coal production, the report continues, is largely due to seasonal demand. This seasonal demand is responsible for 47 per cent of the idle time of the coal industry. Seasonal demand also contributes to another very disturbing element, namely, the overdevelopment of mine capacity through opening too many mines. The two factors of intermittent or seasonal operation and overdevelopment are in a large measure responsible for the ills of the coal industry.

The report sets forth "a simple and practical remedy," saying that it is the coal consumer who must start the cycle that will bring about a stabilized industry.

"The amount of storage required to produce these corrective and constructive results," the committee declares in summarizing its conclusions, "is small in terms of the per cent of annual con-

sumption. For seasonal storage, from 9 to 10 per cent of the annual consumption is all that is required. If this amount is supplemented by additional reserve storage of no more than 7 per cent, the result will be an accumulation of some 83,000,000 tons of coal in storage by Sept. 30 of each year. The practicability of this amount of storage with but slight additional outlay for equipment is indicated by the fact that on Sept. 1, 1923, there was 56,000,000 tons in storage.

"Equipment has been developed and may be obtained to meet any storage situation or requirement. The cost of such equipment ranges from a few cents per ton of capacity up to \$2.50 or \$3 per ton of capacity.

"All kinds of coal have been and may be successfully stored. The cost of storage per ton, including fixed charges on equipment, maintenance and operation expense and interest on investment in coal as well as taxes and insurance, in most instances does not exceed 75c. per ton yearly. More generally it is around 50c. per ton yearly. This cost is insignificant when distributed over annual consumption.

"To increase transportation facilities to meet the peak demands resulting from the prevailing unsystematic practice in coal shipment would require an additional investment of some \$12,000,000,000. Such an investment is not justified.

Railroads Have Most to Gain

"The railroads have more to gain by storing coal than any other class of consumer. In general, storage should take place at the point of use, to accomplish the most in relieving transportation and safeguarding supply. In general, storage at mines is not recommended. Cars should be assigned to mines upon the basis of coal actually sold and not upon rated capacity of production."

While the report refers primarily to industrial consumers of bituminous coal, the householder, the committee says, is in a position to aid with the least cost, because no special equipment for storing and reclaiming is required and his individual investment in coal is relatively small. Householders use approximately 50,000,000 tons of bituminous coal annually, which, if placed in their bins by the end of September

Nebraska Loses on Its Coal

Governor Charley Bryan, of Nebraska, is among those who regard coal producers as "barons." So last winter he ran a good many coal yards throughout Nebraska, undercutting the dealers. It was more or less of a success until they footed up the bills at the end of the year. Omaha, for instance, is short \$8,000 and the City Council is still wrangling over how to pay the deficit. There are about 900 tons of coal on hand, for which the city cannot get over \$3 a ton, which is less than cost, and this coal is estimated by city authorities to have depreciated about 50 per cent in value by long storage. So Governor Charley Bryan may not be so sure about coal baronism now.

of each year, would materially contribute to the solution of the coal problem.

"Federal, state, city and other civic divisions of the body politic are not meeting their responsibility in relation to the seasonal storage of coal," the committee states. "They are as derelict in regard to seasonal storage as are other users, and frequently add to a confused situation by obtaining priority orders. Public officials should take the lead, by precept and by example, in furthering the storage of coal.

"The evil practice of indiscriminate breaking of coal contracts has seriously injured the American coal industry with reference alike to production, transportation and consumption. Contracts for coal should be observed with the same good faith as universally prevails in regard to other forms of commercial contracts."

The personnel of the committee which made the investigation follows:

W. L. Abbott, chief operating engineer of the Commonwealth Edison Co. of Chicago, chairman; H. Foster Bain, Director of the Bureau of Mines, Washington; William Hutton Blauvelt, consulting engineer, New York City; W. H. Hoyt, chief engineer of Duluth, Missabe & Northern Ry., Duluth, Minn.; William J. Jenkins, vice-president and general manager of the Consolidated Coal Co. of St. Louis; David Moffat Myers, consulting engineer, New York City; Prof. S. W. Parr, University of Illinois, Urbana; Dean Perley F. Walker, University of Kansas, Lawrence; Roy V. Wright, managing editor of *Railway Age*, New York; Edgar S. Nethercut, secretary of the Western Society of Engineers, Chicago, and O. P. Hood, U. S. Bureau of Mines, Washington.

Accidents at Coal Mines During May Resulted in Loss of 131 Miners' Lives

Accidents at coal mines in the United States during May, 1924, killed 131 men, according to information received from state mine inspectors by the Bureau of Mines. The production of coal during the month was 38,981,000 tons; thus the fatality rate was 3.36 per million tons. This compares with a rate of 6.44 in the preceding month, 3.40 for May, 1923, and an average rate of 3.68 for May during the ten years 1914 to 1923. For bituminous mines alone the fatality rate for May, 1924, was 3.04 per million tons, as compared 2.89 for May last year and a ten-year average rate of 3.25. For anthracite mines alone the rate was 4.65 per million tons, as against 6.18 for May, 1923, and a ten-year average rate of 5.84.

Accident records for the first five months of 1924 show 1,132 lives lost, representing a fatality rate of 4.81 per million tons of coal produced. For the same period last year the death rate was 3.94. The five-month fatality rate for bituminous mines alone was 4.73 in 1924 and 3.65 in 1923; for anthracite mines alone it was 5.21 in 1924 as compared with 5.53 in 1923.

Explosions of gas or coal-dust are the only class of accidents showing increased fatality rates in 1924 as compared with 1923. All the other main causes—falls of roof and coal, haulage, explosives and electricity—show reduced rates.

Accident-Prevention Work Spreads in Pennsylvania

Accident-prevention meetings conducted by the State Department of Mines in the anthracite districts of Pennsylvania have been so successful, Secretary of Mines Joseph J. Walsh said in a recent statement, that similar meetings will be conducted in the bituminous region. The bituminous inspectors have been instructed to take up the question of holding safety meetings with the operators. It is proposed that a series of meetings be held in every section of the bituminous territory.

"The gathering of the superintendents, mine foremen and firebosses in the various anthracite sections has had an excellent effect," Secretary Walsh said. "There was real co-operation and the men entered into the safety discussions with unusual interest."

"In the bituminous region, the stone dusting of mines to prevent explosions of coal dust is receiving a great deal of attention. The experiments conducted thus far have proved the effectiveness of this method of accident prevention and I expect that the operators generally will avail themselves of this means of lessening mine hazards. This method and others will be discussed at meetings in the bituminous region."

New River Co. Asks Rehearing Of Joint Mine Case

The New River Co., of West Virginia, has filed a petition with the U. S. Supreme Court asking a rehearing of the joint mine case which was decided by that tribunal June 9. The petition will not come before the court for action until October.

In the joint mine case, the Supreme Court, with Justice McKenna dissenting, upheld the constitutionality of rule 4 of the car service circulars of the Interstate Commerce Commission, in which the commission set down the policy that in periods of car shortage a mine located on more than one railroad should not receive a total allotment of cars in excess of its gross rating. This rule placed joint mines on the same basis as local mines.

In its petition for rehearing, the New River Co. asserts that, owing to the fact the case was advanced for argument, there was not sufficient time for adequate preparation on the part of the coal companies operating joint mines. Attention is called to the fact that rule 4 affects shippers of all goods who are served by more than one carrier if its application is carried to a logical conclusion. It is furthermore contended that the court paid more attention to the question of jurisdiction involved in this case than to the property rights which it is insisted were involved, or to the obligations of the carriers to provide adequate transportation. As another point the petition contends that under rule 4 joint mines are actually placed at a disadvantage in comparison with local mines.

Coal-Mine Fatalities During May, 1924, by Causes and States

(Compiled by Bureau of Mines and Published by Coal Age)

State	Underground											Shaft				Surface						Total by States					
	Falls of roof (coal, rock, etc.).	Falls of face or pillar coal.	Mine cars and locomotives.	Gas explosions and burning gas.	Coal-dust explosions (including gas and dust combined).	Explosives.	Suffocation from mine gases.	Electricity.	Animals.	Mining machines.	Mine fires (burned, suffocated, etc.).	Other causes.	Total.	Falling down shafts or slopes.	Objects falling down shafts or slopes.	Cage, skip, or bucket.	Other causes.	Total.	Mine cars and mine locomotives.	Electricity.	Machinery.	Boiler explosions or bursting steam pipes.	Railway cars and locomotives.	Other causes.	Total.	1924	1923
Alabama	3		1										5												1	6	3
Alaska								1																	1	0	0
Arkansas																									1	0	1
Colorado	2		1										3												1	4	12
Illinois	1		1		1								3											1	3	15	2
Indiana			1										1												1	2	2
Iowa													1													1	1
Kansas	1												1												1	1	1
Kentucky	9	1	4	1				1					16								1				1	17	6
Maryland																										0	0
Michigan																										0	0
Missouri			1										1													1	0
Montana																										0	0
New Mexico																										0	0
North Dakota	1									1			2												2	2	4
Ohio	5		2										9												1	10	1
Oklahoma							2																	1	1	0	1
Pennsylvania (bituminous)	9	1	2					1					13													13	34
South Dakota																										0	0
Tennessee	3		2					2					7													7	1
Texas																										0	0
Utah																										0	1
Virginia	2		1										3													3	1
Washington																										0	2
West Virginia	11		9					3					23							1					2	3	26
Wyoming																										0	3
Total (bituminous)	48	2	25	2				10	1				88							1	1				4	95	133
Pennsylvania (anthracite)	12	7	4				4					6	33												2	36	53
Total, May, 1924	60	9	29	2		4		10	1			6	121						3	3	2	1		1	6	131	
Total, May, 1923	89	8	72	14		12	1	10	1	2		10	174	3				3		3	2			1	3	186	

Jones Preaches Safety By Using Rock Dust at Rocky Mountain Mines

John E. Jones, rock-dust expert, has spent a month traveling the highways and byways of the Rocky Mountain coal mining region preaching safety by dusting. His tour was arranged by the Bureau of Mines. Mr. Jones was borrowed by the Bureau from the Old Ben Coal Corporation, of Illinois. He had as traveling companions most of the time C. L. Duer, district supervisor of the Bureau's leasing division, and H. I. Smith, mining supervisor for the same division.

During late May, Jones, Smith and Duer spent several days at the Stag Canyon mines of the Phelps-Dodge Corporation, at Dawson, N. M., and on June 3, 4 and 5 they met R. L. Hair, division engineer, and Robert McAllister, mine inspector for the Colorado Fuel & Iron Co., and with them, visited the Morley, Sopris, Primero, Frederick, Berwind, Tabasco and Toller mines of that company. On the evening of June 4 Mr. Jones talked before the superintendents' and foremen's club of the Colorado Fuel & Iron Co. at Trinidad, Colo.

On June 5 the party visited the Bon Carbo mine of the American Smelting & Refining Co. and in the afternoon made a trip to the Lodge of the Whispering Pines near Stonewall, Colo. On June 6 and 7 Jones, Smith and Duer visited some of the Victor-American Fuel Co.'s and the National Fuel Co.'s mines. On the night of June 6 Mr. Jones spoke at a safety meeting in Walsenburg, Colo. Thus ran his "triumphal tour" so far as it covered the southern and central parts of the territory he visited.

Creating New Industries to Make Jobs for Miners

Indiana has sat around and done nothing for its jobless miners about as long as it can stand it. The state conservation department has a scheme and the first effort to try it out is being made now in and around Clinton. The department is making geologic and industrial surveys of the region to point out to capital the local resources which might be developed in order to create new industries in which the jobless and suffering union miners nearby can find work. The Clinton territory contains shales, sands, clays, gravels and ferruginous materials that might profitably be produced and used for the manufacture of concrete, road building and ceramic materials and other products. Dr. W. N. Logan, state geologist, is working on the matter.

Merger Movement Appears in Pennsylvania

The Hillman Coal & Coke Co. of Pittsburgh, Pa., has acquired and merged with that corporation five other companies directly connected with the operating end of the coal industry. The merged company will operate under the name of the Hillman Coal & Coke Co. and will have a capitalization of \$8,752,000.

The companies taken in by the parent corporation are the Diamond Coal & Coke Co., the Merchants Coal Corporation, the Jenner Quemahoning Coal Co., the Pittsburgh & Baltimore Coal Co., and the Naomi Coal Co.

Say C. & O. Imperils Rail Brotherhood Mine Road

The Brotherhood of Locomotive Engineers' investment in coal and rail properties in West Virginia, representing approximately \$3,000,000, faces ultimate failure if the Interstate Commerce Commission denies the application of the Coal River & Eastern Ry. for an order authorizing the company to operate in interstate commerce between coal mines owned by brotherhood members and the Chesapeake & Ohio R.R., according to representations to the commission by the Coal River & Eastern in support of its application.

The Chesapeake & Ohio is making a vigorous fight against approval of the application, contending that the lines controlled by the brotherhood members between their coal mines and the C. & O. are nothing more than spur tracks and therefore not admissible as a part of the interstate transportation system. The Chesapeake & Ohio also charges that the proposed capitalization of \$1,500,000 of the Coal River & Eastern is grossly excessive. It says the capitalization has as a basis \$750,000 as the value of surface right-of-way land worth but a few thousand dollars at most.

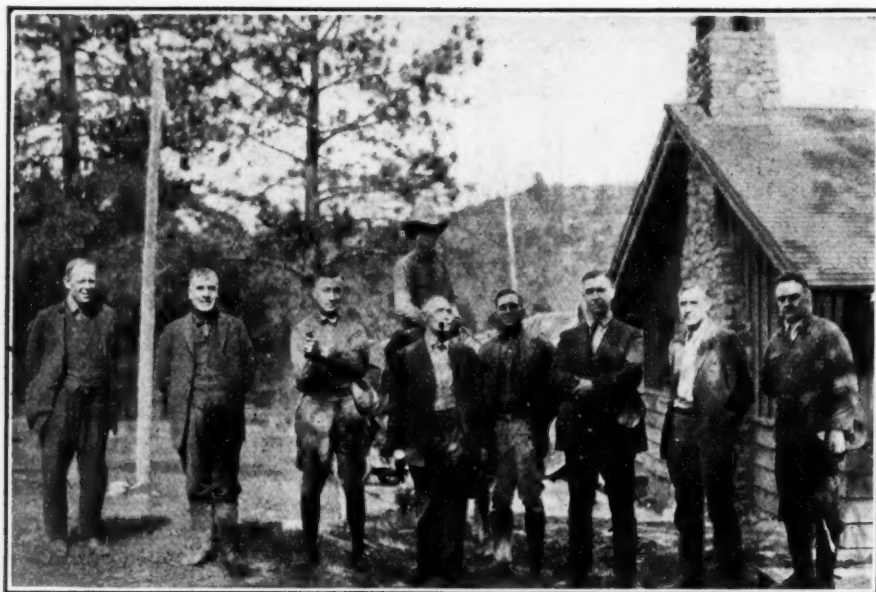
The tracks in issue connect the mines of the Coal River Collieries, a brotherhood company, in Boone County, W. Va., with the Chesapeake & Ohio. They are now owned and operated as a private railroad by the Coal River Collieries. The Coal River & Eastern was organized to take over the lines and operate as a common carrier in interstate commerce.

The Coal River & Eastern has authorized the issuance of \$500,000 of bonds and \$1,000,000 of common stock. It is proposed to deliver the bonds and \$250,000 of the stock to the Coal River Collieries for the railroad. The Brotherhood Investment Co., another engineer brotherhood organization, will offer \$750,000 of the stock to individual investors.

The charge is made by the Coal River & Eastern that the "real basis of the protest by the Chesapeake & Ohio is the pursuance of the policy which it has persisted in from the beginning of resisting the application of its group rates to independent short lines."

The Chesapeake & Ohio, however, says the Coal River & Eastern has admitted that the sole purpose of organizing the railroad company was to compel the Chesapeake & Ohio to extend its Kanawha district coal rate to the brotherhood mines and to compel the Chesapeake & Ohio to divide with the Coal River & Eastern its Kanawha district coal rate. It further says it refused to operate over the tracks in issue because they were unsafe for such operation.

Approval of the application, the C. & O. contends, would have the effect of transferring from the Collieries company to the C. & O. not only the expense of moving empty and loaded cars between the brotherhood mines and the connections with the C. & O. but also the burden of investment of the Collieries company in necessary railroad facilities connecting the C. & O. with the mines.



Here We Have Jones and His Party at "Lodge of the Whispering Pines"

The party had visited the Bon Carbo coal mine of the American Smelting & Refining Co. that forenoon and were entertained at the Lodge. Those in the picture, left to right, are: C. L. Duer, district supervisor, leasing department, Bureau of Mines; Robert McAllister, mine inspector, C. F. & I. Co.; H. H. Bubb, general superintendent, American Smelting & Refining Co., Cokedale, Colo.; W. M. Laurie, deputy state coal mine inspector; Mr. Garrett, superintendent, American Smelting & Refining Co., Bon Carbo, Colo.; R. L. Hair, division engineer, C. F. & I. Co.; H. I. Smith, mining supervisor, Bureau of Mines, leasing department; John E. Jones, safety engineer, Old Ben Coal Corporation, West Frankfort, Ill. The gentleman in the six-gallon hat must remain unknown. He probably was there merely to furnish atmosphere.

Sop to Radicals of Northwest Seen in Democratic Anthracite Plank

Adoption Due to Pressure from New England—Non-Partisan Element Provides Loophole Against Hampering Private Enterprise—Selfish Interests Could Keep Regulatory Legislation Before Congress

BY PAUL WOOTON
Washington Correspondent of Coal Age

Pressure brought by New England members of the resolutions committee of the Democratic National Convention resulted in the adoption of this plank in the party's platform:

"We pledge the Democratic party to regulate by governmental agencies the anthracite coal industry and all other corporations controlling the necessities of life where public welfare has been subordinated to private interests."

While the loophole provided by the concluding phrase is large enough for a sound administration to make use of without being open to the charge of violating a platform pledge, this declaration paves the way for the radicals and the selfish to bring in and keep before Congress coal-regulation proposals.

New England has been more outspoken than any other section in regard to the desirability of keeping the government out of business and of preserving private initiative in business. Were the consumers of dry goods to propose regulation of the textile industry because there is an indefensible spread between the cost

of cotton and its manufactures New England would be ready to leave the Union. The sentiment in New England, which is typified by the Democratic plank, is not partisan. Republican members of Congress from those states have been active in forwarding the regulation idea in so far as anthracite is concerned. In this they have had the support of the radicals from the Northwest, who in addition to being radical also have had trouble in recent years in obtaining coal at prices which they regard as reasonable.

While the sessions of the Democratic resolutions committee, which framed the platform, were executive, it is understood that this plank provoked little comment. The committee was so torn by its differences over the Ku Klux Klan and the League of Nations planks that it had little time to give consideration to a "minor" matter such as regulating the coal industry.

There was no opportunity for the convention itself to pass upon the respective merits of the different planks. Separate votes were had only on the two controverted planks mentioned.

More Connellsville Plants Return to 1917 Scale

Following the lead taken a few weeks ago by most of the other independent companies in the Connellsville (Pa.) coke region, W. J. Rainey, Inc., the Republic Iron & Steel Co. and the Crucible Fuel Co. reduced wages on July 1 to the Nov. 10, 1917, scale. As the Rainey company had been working full time up to the time of the reduction, some of the men decided they would not stand for the reduction, and did not go to work July 1. None of the men at the Royal and Allison plants went to work, so these plants were promptly closed down by the company for an indefinite period. At the Mt. Braddock plant about half of the men continued at work and this plant is continuing to operate. The Revere, Paul and Elm Grove plants continued operating in full.

The Republic Iron & Steel Co. has only two mines in operation in the region, Bowood and Martin, and these continued without interruption. The Crucible Fuel Co. plant, which had been idle for several weeks, resumed with a full force.

The only companies in the region now that have not gone back to the November, 1917, scale are the H. C. Frick Coke Co., subsidiary of the United States Steel Corporation, and the Monessen Coal & Coke Co., subsidiary of the Pittsburgh Steel Co. The Frick company has resumed operations at the Bridgeport mine and increased working time at the Colonial plants, but has closed Leisenring No. 3 mine.

Ohio Miners Conciliatory on Wage Concessions

A two-day joint meeting of operators and miners in the southern Ohio field was held at Logan beginning July 1. The conference was called upon the invitation of miners in an effort to arrive at an agreement relative to concessions to be made on the wage scale in order to permit mines in that field to open in competition with other fields. Practically all of the larger operators were represented.

A conciliatory mood was shown by the miners as a rule and many propositions to reduce the cost of dead work and to reduce expenses generally were made. A joint scale committee was then named to canvass the situation and report back at a future meeting. Operators on the scale committee are James H. Pritchard, commissioner for the Southern Ohio Coal Exchange; F. S. Knox, Jr., New Pittsburgh Coal Co.; G. J. Jones, Ohio Collieries Co.; T. R. Biddle, Biddle Coal Co.; O. S. Newton, Sunday Creek Coal Co.; P. C. Morris, New York Coal Co.; R. T. West, N. D. Monsarrat, Monsarrat Bros., and H. Charleton.

Last Kanawha Operators Retire from Union Fold And Announce New Scale

Despite persistent efforts of the owners of union mines in the Kanawha district of West Virginia to reach an amicable agreement with District No. 17, United Mine Workers, the last union operators in southern West Virginia left the fold Monday, July 7, according to an announcement by Duncan C. Kennedy, secretary of the Kanawha Operators' Association. Mr. Kennedy stated that every suggestion made by the producers was vetoed by the union's representatives, who frankly stated that it must be the Jacksonville agreement or nothing.

"To continue the 1923 wage scale in this district would mean to keep all the union men in it out of employment, as we could not operate the mines," said Mr. Kennedy. "The scale that we have offered is absolutely the best that we can do. The tonnage rates are the same as those in the 1917 scale, while the day wages are higher."

The new scale follows:

GAS SEAMS	
Pick mining.....	\$0.70
Pick mining, Powellton Seam.....	.67
Yardage in pick entries.....	1.24
Machine loading in rooms.....	.44
Machine loading in entries.....	.49
Machine cutting in rooms and entries.....	.10
Machine cutting, turret and arcwall.....	.06
NO. 5 SEAM	
Pick mining.....	.12
Yardage and pick entries.....	1.37
Machine loading in rooms.....	.45
Machine loading in entries.....	.49
Cutting rooms.....	.10
Cutting entries and room necks.....	.11
Machine cutting, turret and arcwall.....	.06
COALBURG SEAM	
Pick mining.....	.78
Yardage, pick entries.....	1.55
Machine loading, rooms.....	.50
Machine loading, entries and room neck.....	.55
Machine cutting, rooms.....	.11
Machine cutting, entries and room neck.....	.12
Machine cutting, turret and arcwall.....	.07
RAYMOND CITY SEAM	
Pick mining over 1 in. screen per 100 bushels.....	\$4.16
Yardage in entries.....	1.55
Pick pillar coal, retreating, gas seam.....	.61
Splint seam.....	.67

No yardage to be paid in airways, following entries or breakthroughs, where the width exceeds 15 ft.

GRADUATED SCALE FOR GAS AND SPLINT SEAMS

Machine loading	Gas	Splint
4 ft. and over.....	\$0.43	\$0.44
3 ft. 9 in. to 4 ft.....	.44	.45
3 ft. 6 in. to 3 ft. 9 in.....	.46	.47
3 ft. 3 in. to 3 ft. 6 in.....	.48	.49
3 ft. to 3 ft. 3 in.....	.50	.51

Machine cutting below 4 ft. shall be increased 1¢ per ton for each 3 in. in accordance with graduated scale. Graduated scale applies to all seams except those based on Coalburg.

INSIDE DAY WAGE SCALE

	Hour Rate	Day Rate
Drivers, 1 mule.....	\$0.59	\$4.76
Drivers, 2 mules.....	.61	4.92
Tracklayers.....	.61	4.88
Tracklayers, helpers.....	.57	4.56
Slate shooters.....	.58	4.64
Greasers.....	.32	2.56
Trappers.....	.32	2.56
Spraggers and couplers.....	.33	2.80
Old men trappers.....	.43	3.44
Motor and machine runners.....	.62	5.00
All other inside day labor.....	.56	4.52

July Circular Prices for Anthracite

	Broken	Egg	Stove	Nut	Pea	Buck No. 1	Rice	Barley
Philadelphia & Reading.....	\$8.95	\$8.95	\$9.10	\$8.95	\$6.00	\$3.00	\$2.25	\$1.50
Erie.....	8.70	8.70	8.80	8.60	5.50	3.00	2.00	1.50
Hudson Coal Co.....	8.80	8.80	8.80	Range	8.80	3.15	Boiler	1.60
Lehigh Valley.....	8.50	8.75	8.95	8.95	5.75	3.00	2.00	1.50
Lehigh & Wilkes-Barre Coal Co.....	8.00	8.55	8.55	8.55	5.75	3.00	2.00	1.50
Lackawanna.....	8.00	8.55	8.55	8.55	5.85	3.00	2.00	1.50
Lehigh Coal & Nav. Co.....	8.95	8.95	9.20	9.05	6.00	3.00	2.00	1.50

Fierce Battle Now Rages Over Electric Cap Lamps At Oklahoma Coal Mines

They are still enjoying frontier stuff down in the coal fields of Oklahoma. Once they had the infamous "Molly Maguires." Now they have bolsheviki and "wop lawyers" and "saddle-colored coons" defying John L. Lewis' union and fighting "the battle of the cap lamps" with mass meetings where they threaten to kill somebody and into which hated but intrepid Bureau of Mines men walk unarmed. And all the while the three Hartshorn mines of the Rock Island Coal Mining Co. are tied up tight.

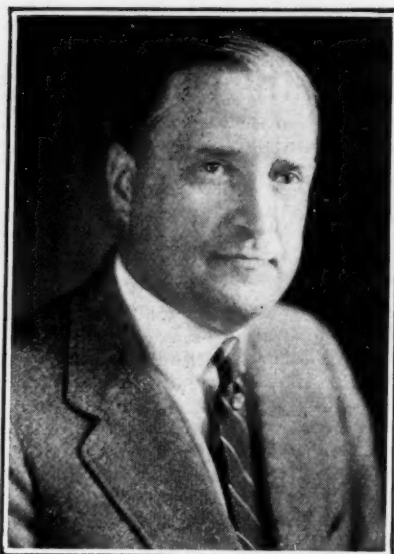
The whole business started almost two years ago, when the Rock Island company introduced electric cap lamps into its No. 12 mine. This move in the interest of safety was disapproved by a section of the district union organization and by State Inspector Edward F. Boyle. However, the company was sold on the idea, as were several other coal producers of the region. So in the settlement made for the Southwestern Interstate district in May, based on the Jacksonville agreement, the operators insisted upon an electric cap lamp provision, which was written into the contract after a long dispute.

In the dispute, Andrew McGarry, district president of the miners, and his district committee refused to accept an arbitration decision by Dave Frampton, an international union representative, in which Frampton recommended that the question go to the joint board for settlement under the contract while the lamps were used in Rock Island mines Nos. 7, 9 and 12 and while the mines went ahead and worked. But McGarry appealed to international union headquarters. By unanimous vote of the international board Frampton's decision was supported. Then the agreement was signed at Kansas City and everybody expected the Rock Island mines to go to work with electric cap lamps when the rest of the state resumed. But it was not so. State Inspector Boyle burst out with an order barring every sort of lamps underground in Oklahoma except carbide lamps.

Inspector Boyle's position is represented to be this: Electric cap lamps are so safe that mining companies using them will neglect their ventilation, to the detriment of Oklahoma miners. Boyle threatened to arrest the entire Rock Island railroad if necessary, and Mine Superintendent Jones in particular, if those cap lamps went below.

Then followed mass meetings of miners. They rallied around McGarry and around their paid lawyers and even around Inspector Boyle.

But it chanced that Frank Feehan, once president of District No. 5 miners' union, Irish by nature and with a fist the size of a ham at the end of each able arm, joined the Bureau of Mines service May 1 as a safety commissioner and was in Oklahoma at the time. Hearing about all this blood-thirstiness on the part of a controlling element of the Oklahoma district, believing in the righteousness of electric cap lamps and being Irish, he strode



©Underwood & Underwood
Richard F. Grant
President U. S. Chamber of Commerce

onto the platform at the next miners' outdoor mass meeting in Hartshorn, announcing that the assemblage could look him over. He was one of those hated government men they so yearned to puncture.

There ensued a dialog substantially as follows:

Mr. Feehan: "I'm going to address this meeting. I—"

Mr. Chairman: "You ain't neither. Nobody ast you to—"

Mr. Feehan: "I don't have to be asked. You have been misleading a lot of these miners and keeping them from working and—"

One hundred flivvers: "Whrrrt! Honk! Honk! Whrrrrrt! Whrrt!"

Mr. Feehan: "Honk your horns off; I'm going to be heard. You men simply don't know what you're doing in this fool fight against electric lamps. I'm here to give you the facts in—"

A kindly voice: "Get ta hell outa here while you're still in one piece."

But finally Feehan said his say. And they do say it was full of straight-arm thrusts and jabs to the wind.

Before the meeting was over there was a different feeling evident toward Feehan and electric cap lamps. A few days later a delegation of miners called on Boyle and asked him to lift his ban on lamps. Their families are hungry and the Rock Island's three mines stand ready to give 900 of them almost steady work.

A wave of sentiment against the controlling union element in Hartshorn appeared to develop. For one thing a viciously worded "Warning" flier was posted all over Hartshorn against the "bolsheviki" and the "saddle-colored coons" and others thought to be responsible for the mine shutdown. For another, a miner met a union lawyer on the street and beat him up with what is known as neatness and dispatch.

But the latest news from the front in "the battle of the electric lamps" is that Inspector Boyle's order still stands and the three Rock Island mines are still down, although nearly 100 company men are daily going in and out of them wearing electric cap lamps without getting arrested.

R. F. Grant Is New Head of U. S. Chamber of Commerce

Richard F. Grant, of Cleveland, vice-president of the M. A. Hanna Co. and a former president of the Cleveland Chamber of Commerce, was elected president of the Chamber of Commerce of the United States at a meeting of the board of directors, July 1 in Washington. He succeeds Julius H. Barnes, of Duluth, who declined another term. The board also elected Owen D. Young, chairman of the board of the General Electric Co., as a director to take the place of Lewis E. Pierson, chairman of the board of the Irving Bank-Columbia Trust Co., of New York, who was recently elected vice-president for the Eastern District of the National Chamber. John H. Fahey, Boston publisher, who was the second president of the National Chamber and who served several years as a member of the senior council, was elected an honorary vice-president.

In addition to his interests in the M. A. Hanna Co., one of the large producers of coal, iron and steel, Mr. Grant, the new president, has taken an active interest in public affairs. He was born at Owatonna, Minn., in 1879. He obtained his Ph. B. degree at Yale in 1899 and was graduated with a Bachelor of Law degree from the New York Law School in 1901. He took up the practice of law in Duluth in 1901 as a member of the firm of Sullivan & Grant. In 1909 he became general counsel of M. A. Hanna & Co., a partner in the firm in 1917, and in 1923, when its interests were taken over by the M. A. Hanna Co., he became vice-president.

Mr. Grant also is president of the Susquehanna Collieries Co., vice-president of the Hanna Furnace Co., president of the Virginia Ore Mining Co., and a director in the Cleveland Trust Co. and many other business institutions. He was appointed by President Wilson a member of the National War Finance Committee of the American Red Cross and served as chairman of the membership and finance drives for Ohio, Indiana and Kentucky in 1917. He also is a member of the American Bar Association and the American Iron and Steel Institute.

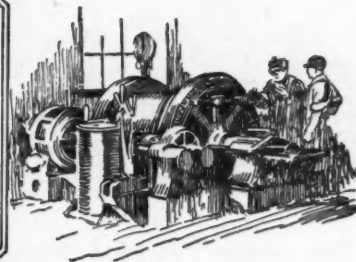
Carnegie Plant at Clairton Is Now Biggest Coke Producer

With the first output of coke recently at the newly completed units of the byproduct coke ovens at the Carnegie Steel Co.'s works at Clairton, Pa., the plant became the largest in the world. It has a total of 1,134 ovens having an annual carbonizing capacity of 8,085,000 tons of coal and a yield of 6,350,000 tons of coke.

The latest addition, consisting of 366 ovens arranged in six batteries of 61 ovens each and having a carbonizing capacity of 8,500 tons of coal per day, had been under construction nearly two years. It will produce daily 6,000 tons of coke, 55,000,000 cu. ft. of gas, 90,000 gallons of tar, 215,000 lb. of ammonium sulphate and 25,000 gallons of benzol products.



Practical Pointers For Electrical And Mechanical Men



Reasons Why Open-Delta Connected Transformers Often Burn Up

Phase Relations Often Overlooked—Two Open-Delta Connected Transformers Cannot Carry Two-Thirds the Kilowatt Load of Three Fully Loaded Delta-Connected Units

By O. E. KENWORTHY

Electrical Engineer
Lehigh Valley Coal Co., Wilkes-Barre, Pa.

Though many operating companies have their transformers connected in open delta the principles under which the transformers operate, though quite simple, is not clearly understood and needs explaining.

To present this explanation let us consider Fig. 1 which represents schematically a three-phase load connected to the secondaries of three transformers. Both the load and transformers are connected in delta. Let us assume that the load is balanced and that each transformer is delivering the same amount of current.

Also let us represent the value of the transformer secondary currents by i ; then

$$i_1 = i_2 = i_3 = i$$

The line current we know has a value equal to 1.73 times the transformer secondary current. Representing the value of the line current by I we have

$$I_1 = I_2 = I_3 = I, \text{ and } I = \sqrt{3} \times i$$

The power delivered by each transformer can be indicated by the letter P . Hence

$$P_1 = P_2 = P_3 = P$$

Now if E is the voltage at the secondary terminals of each transformer. Then

$$P = Ei \cos \theta$$

where $\cos \theta$ is the power factor of the transformer secondary.

The total power P_t delivered by the three transformers is

$$P_t = 3 Ei \cos \theta$$

Substituting for i in this equation its value expressed in terms of line current we have when $i = \frac{I}{1.73}$

$$P_t = 3 E \times \frac{I}{1.73} \cos \theta \\ = \sqrt{3} EI \cos \theta$$

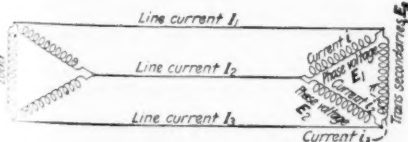


Fig. 1—Usual Delta Connection

This illustration represents the current and voltage values when the load is balanced and three single-phase transformers are delta connected.

Fig. 2 shows the relation of the voltages and current. Fig. 3 is a schematic diagram of the load in Fig. 1 connected to the same bank of transformers but with one of the three transformers cut out of service, or in other words connected open-delta. Assuming that the load has not changed we will have the same values of line current as before, i.e.,

$$I_1 = I_2 = I_3 = I$$

However, the value of the transformer secondary current is now equal to the line current, but it lags behind the secondary voltage by an angle which is 30 deg. greater than before. Instead of the power factor of the secondaries being the cosine of θ degrees it is now $\cos (\theta + 30 \text{ deg.})$.

The total power delivered by the two transformers is now

$$P_t = 2 EI \cos (\theta + 30 \text{ deg.})$$

For simplicity let us consider $\theta = 0 \text{ deg.}$; then

$$P_t = 2 EI \cos 30 \text{ deg.} = 2 E \times \sqrt{3} i \times \cos 30 \text{ deg.}$$

By proportion we have.

$$\frac{P_t \text{ (1st case)}}{P_t \text{ (2nd case)}} = \frac{3 Ei \cos \theta}{2 \sqrt{3} Ei \cos (\theta + 30 \text{ deg.})}$$

$$\text{but since } \theta = 0 \text{ deg.}$$

$$\frac{P_t \text{ first case}}{P_t \text{ (second case)}} = \frac{3}{2 \sqrt{3} \times 0.866} = \frac{3}{3} = 1$$

which is true because we assumed the load to be the same in both cases. However, the following is also true: The power in one transformer in the second case was

$$E \sqrt{3} i \cos (\theta + 30 \text{ deg.})$$

and the power in one transformer in the first case was $Ei \cos \theta$

Assuming again that $\theta = 0 \text{ deg.}$

$$\frac{E \sqrt{3} i \times 0.866}{Ei} = 1.5$$

or each transformer in the second case is delivering 50 per cent more power than each transformer in the first case. The kilowatt capacity of each transformer is now exceeded by 50 per cent. Again, the kilovolt-ampere of each transformer in the second case is

$E \sqrt{3} i$; whereas in the first case it is Ei .

$$\text{Therefore } \frac{E \sqrt{3} i}{Ei} = \frac{1.73}{1}$$

or the kilovolt-ampere capacity of each transformer in the second case is exceeded 73 per cent. This fact is vitally important as will be recognized when it is recalled that transformers are rated on their kilovolt-ampere capacity. By inverting the last equation we get the decimal 0.577. We can say then that the kilovolt-ampere capacity in the first case is 57.7 per cent of the kilovolt-ampere capacity of each transformer in the second case.

Let us further consider a third condition using Fig. 3 again. We will now reduce the load to the point where the value of current in each transformer is equal to the current values in the first case, but at the same time keep it balanced. This means that now we have made the kilovolt-ampere capacity of each transformer in this, the third case, equal to the kilovolt-ampere capacity of each transformer in the first case. The line current is now

$$i_1 = i_2 = i_3 = i$$

The current in each leg of the three-phase load is $\frac{i}{1.73}$.

The load in the first case was

$$3 Ei \cos \theta$$

but is now $3 Ei \cos \theta \div 1.73$

By proportion again

$$\frac{\text{load (third case)}}{\text{load (first case)}} = \frac{3 E \frac{i}{1.73} \cos \theta}{3 Ei \cos \theta} = \frac{1.73}{3} = 0.577$$

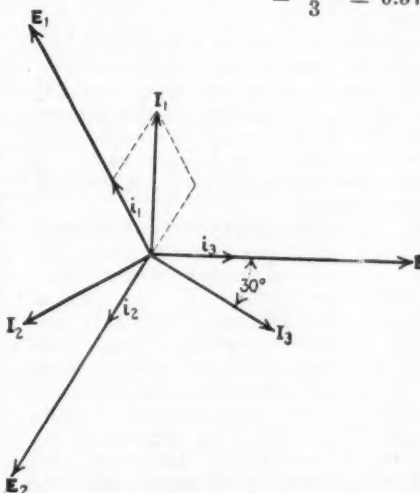


Fig. 2—Vector Relations in Delta-Connected Circuits

Note that the line currents lag behind the corresponding transformer currents 30 deg. The line current is always the vector sum of currents in the two transformers.

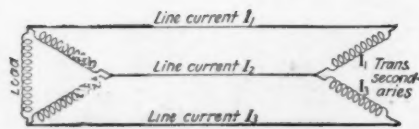


Fig. 3—Open-Delta Current Relations

Here the line current is equal to the transformer current but it lags behind the transformer current 30 deg. more than when the three transformers are delta-connected.

This means that when two transformers are placed in open-delta service they are capable of delivering only 57.7 per cent of the kilowatt capacity that the three transformers delivered in the first case if they are to be kept within their kilovolt-ampere capacities. Going still farther, in the first case the kilowatt capacity of each transformer secondary was

$$Ei \cos \theta$$

whereas in the third case the kilowatt capacity is $Ei \cos (\theta + 30 \text{ deg.})$. Assuming $\theta = 0 \text{ deg.}$

$$\frac{Kw_1}{Kw_2} = \frac{Ei}{Ei \times 0.866} = \frac{1}{0.866}$$

or the kilowatt capacity of each transformer in an open-delta bank is only 86.6 per cent of what it is in a closed-delta bank of transformers.

We can again prove the statement that two transformers working in open-delta can produce only 57.7 per

cent of the capacity of other transformers working in a closed-delta circuit by the following:

$kw_1 = kw.$ of each transformer connected in a closed-delta

$kw_2 = kw. \times 0.866 = kw.$ of each transformer connected in an open-delta

$3 kw_1 =$ total output of the transformers connected in a closed delta

$2 kw_2 = 2 kw. \times 0.866 =$ total output of two transformers connected in a closed-delta.

$$\frac{2 kw_2}{3 kw_1} = \frac{2 kw_1 \times 0.866}{3 kw_1} = \frac{1.73}{3} = 0.577 \text{ or } 57.7 \text{ per cent.}$$

There are a few other facts in relation to the open-delta connection which are worth while mentioning at this time and they are as follows:

The voltages of the three phases on open-delta connections are a trifle unbalanced but for practical operation the lack of balance is really negligible.

In selecting transformers for a given load the open-delta connection requires transformers approximately 15 per cent larger than for the closed-delta, but there are two units instead of three.

In efficiency and weight the closed delta is practically the same as the open delta, but in cost the latter has a slight advantage.

Selecting the Proper Size Wire For Electric Circuits

In inspecting the electrical equipment of almost any mine many of the feeder circuits will be found to be overloaded, the circuit being required to supply more motors than was originally intended when the feeder was installed.

Whenever a new motor is installed it is connected to the nearest supply line and no further consideration is given to the circuit. Within a short time the feeders are so greatly overloaded that the voltage drop is excessive and the wires become hot.

The safe current-carrying capacity of a single 1/0 rubber-covered wire is about 125 amp. Should this conductor be required to carry 200 amp. it would be overloaded 60 per cent. During the starting period of a motor such a conductor often would carry a much larger current and consequently become hot.

The safe current-carrying capacity of a wire is determined by the current which will pass through it continuously without causing it to become so hot as to damage the insulation or surrounding materials.

We all know that current flowing through a resistance develops heat. The same is true when a current flows through a conductor. The practice of carelessly overloading electrical conductors is more prevalent than generally believed, and the effects upon the conductors are quite serious. If the square of the current flowing through a conductor is multiplied by the circuit resistance, the heat developed, expressed in watts, may be determined. It will be noticed that the heat loss in the conductor varies directly as the square of the current, that is, if the current in any conductor is doubled, the heat is increased four times. Referring to the conductor hav-

ing a normal capacity of 125 amp. but carrying a current of 200 amp. we see that although the current has been increased only 60 per cent, the heat has increased 156 per cent.

This explains why burnouts occur when electrical equipment is overloaded. The excess load may not be very great, but the wires are greatly overheated.

To guard against overloading conductors, the current which is to flow in the line first should be determined, then a suitable conductor should be selected. Whenever the circuit is long, consideration should be given to the voltage drop, as it is possible to select a wire of ample current-carrying capacity but yet too small efficiently to deliver power to the motors connected at the end of the circuit.

The table shows the normal current-carrying capacity of each conductor which in no case should be exceeded, because the starting current required by most mine equipment is from one to four times the normal full-load current.

By following the suggestions given in the table, when installing new feeders, properly functioning circuits will be more common. In laying out new circuits due consideration should be given to future extensions.

Area and Capacity of Rubber-Covered Wires

Wire Size	Area in Circ. Mil	Capacity in Amp.
14	4,133	12
12	6,555	23
10	10,430	32
8	16,466	39
6	26,304	45
4	41,827	65
3	52,740	76
2	66,407	90
1	83,770	107
1/10	105,738	127
2/0	133,425	150
3/0	167,884	177
4/0	211,876	210

Gage Checks Wheel Center

The electric locomotive is one of the most important pieces of mining equipment yet it is in many cases more abused than any other piece of apparatus used in the mines.

Accidents caused by locomotives are nearly always attributable to incorrect operation or lack of proper care of the equipment. At best the service demanded from a mine locomotive is very severe. The strains and shocks that must be sustained even when starting an ordinary trip of mine cars are always quite great. When the track conditions are bad or many of the cars are loaded with rock the strains are much worse.

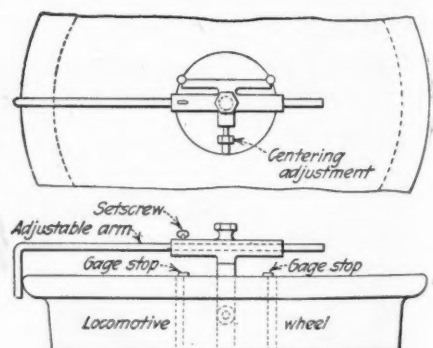
Consequently, if best results are to be obtained, the locomotive should always be kept in good repair. Dangers and damages to the locomotives, cars, track and workmen quickly multiply when the equipment is not properly designed.

One of the best ways to prevent delays and accidents is to repair the locomotives just as soon as conditions warrant. This, however, is not sufficient because a repair should be always as good as the original job.

Rolled-steel wheels are bored after being rolled and the possibility of the bore not being true, although remote, is quite possible. The bore of the wheel should be correctly centered.

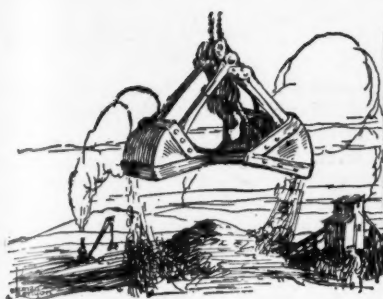
Whenever a new locomotive wheel is used at the shops of the Pennsylvania Coal and Coke Corporation, Cresson, Pa., the device shown in the illustration is used to determine whether the bore is in the exact center of the wheel. The tool consists of a block having two parallel edges and an adjusting screw. This part of the device is placed inside the bore and the adjusting screw tightened to properly center it. When this is done the rotating arm, shown in the illustration, is exactly centered with respect to the axis of the hole. The adjustable arm is next extended and locked in a position where the short right-angled section just touches the outer edge of the wheel flange. By rotating this arm a check is made which determines whether the bore is properly centered.

The best way to avoid accidents is to provide accurately machined repair parts.

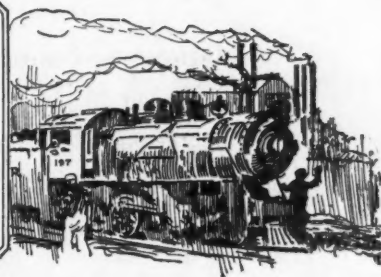


Wheel-Testing Device

After the gage is put in position the adjustable rod is set to touch the outer edge of the wheel flange and rotated. If it touches the wheel at all points on the circumference the machinist is assured the wheel will not operate like an eccentric when mounted on a locomotive driving axle.



Production And the Market



Discouraging Conditions Fail to Dampen Optimism Of Bituminous-Coal Trade

Although visible foundation for hopefulness is lacking—in fact conditions seem to be growing even more discouraging for the time being—the bituminous-coal markets maintain a dogged confidence that the end of the prolonged period of depression is in sight or at the very worst is within hailing distance. As the coal business of late has fairly closely reflected general industrial conditions the predicted revival by leaders in the textile industry and the reported halt in the downward tendency in steel production are hailed as favorable omens. The president of one of the large coal roads, sailing for Europe last week, expressed his confidence that a turn for the better in business conditions would soon take place. All of which would indicate that the positive psychology that is the necessary prelude to a buying movement is being implanted.

Hoover Reiterates Advice to Buy Now

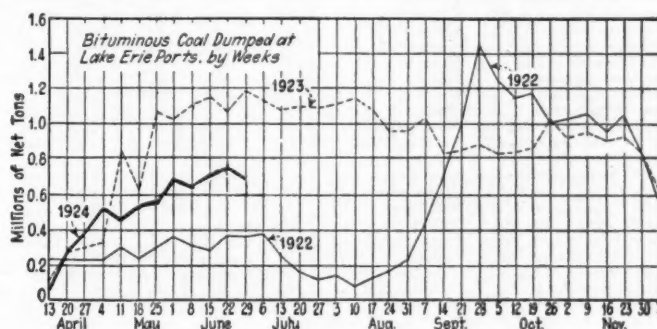
The latest financial report of the Erie R.R. indicates the far-reaching effect of the curtailment of coal movement on the earnings of the coal-carrying roads. That the roads are not doing as much to help themselves as they might is indicated by the reiteration of Secretary Hoover's advice to buy coal before autumn.

Coal Age Index of spot prices of bituminous coal continues to move, if at all, within a narrow range, the figure for July 7 receding to 164, the corresponding price for which is \$1.99. The index figure on June 30 was 166, which represents a price of \$2.01 per net ton, a level which held for three weeks.

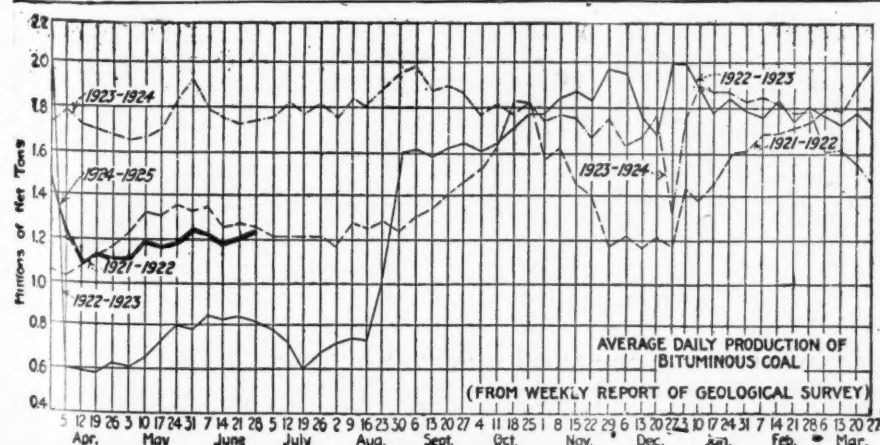
There has been a notable increase in activity at Hampton Roads, dumpings of coal for all accounts during the week ended July 5 totaling 401,935 net tons, representing a gain of 114,065 tons over the last week in June, when 287,870 net tons was handled. Coal dumped at Lake Erie ports during the week ended June 28, according to the Ore & Coal Exchange, was as follows: Cargo, 657,327 net tons; fuel, 41,393 tons.

The figures for the preceding week were 699,519 net tons of cargo coal and 41,168 tons of fuel coal.

The gradual upturn in the production of bituminous coal continues in evidence, output during the week ended June 28, according to the Geological Survey, reaching a total of 7,327,000 net tons, an advance of 125,000 tons over the revised figures for the preceding week, when 7,202,000 tons was produced. Anthracite production also registered an increase during the week ended June 28, when the output was 1,885,000 net tons. This compares with 1,823,000 tons during each of the two preceding weeks.



Quiet has settled over the anthracite market, demand being quite slow. As a result the supply is plentiful for practically all requirements, especially as interruptions to production by local labor troubles are less in evidence. Stove continues to lead in demand, the movement of egg and chestnut, such as it is, being largely dependent upon the amount of stove available. The smaller sizes, including pea and the steam, are inactive and accumulating steadily. The leading companies have added 10c. per ton to their July prices for egg, stove and chestnut, but the independents, having found it difficult to obtain even the old company circular, have announced no advances.



Estimates of Production

(Net Tons)

BITUMINOUS

	1923	1924
June 14.....	10,573,000	7,152,000
June 21 (a).....	10,422,000	7,202,000
June 28 (b).....	10,458,000	7,327,000
Daily average.....	1,743,000	1,221,000
Cal. yr. to date (c)...	270,811,000	226,172,000
Daily average to date	1,770,000	1,479,000

ANTHRACITE

June 14.....	2,053,000	1,823,000
June 21.....	2,042,000	1,823,000
June 28.....	2,105,000	1,885,000
Cal. yr. to date (c)...	51,392,000	45,592,000

COKE

June 21 (a).....	398,000	131,000
June 28 (b).....	399,000	126,000
Cal. yr. to date (c)...	10,002,000	6,083,000

(a) Revised from last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.

Midwest Screenings Softer

The week drilled along in the Midwest without much encouragement to the coal seller and producer. An anticipated slight strengthening of the market stirred up a slight increase in production, and then, when the market remained entirely dormant, prices had a tendency to weaken even from the low points of recent days. Thus southern Illinois screenings sank from a previous low of \$1.75 to a new low of \$1.60 and little moved at more than \$1.75 although there was a skim of country town business as high as \$1.90. Central Illinois prices were not affected. Indiana softened a shade, however.

And now the trade is looking forward to the latter half of this month to start the expected pick-up. Meantime strip mines in Illinois continue to get good running time meeting west Kentucky low prices. Anthracite throughout the Midwest made its scheduled increase of 10 or 12c a ton without stirring up any business.

The Fourth of July lull prevailed during the week in southern Illinois and there was practically nothing doing, with several thousand cars of "no bills" of all sizes on hand. Much discontent prevails among miners on account of no work, although the field generally expects something to start after the Fourth. Some little activity in railroad coal

the last week has helped the situation somewhat. The mines are working from 1 to 2 and 3 days a week. Three days are rare and usually on railroad coal.

Things are quiet at St. Louis. A little domestic is moving for current business on account of wet cold weather. Wagonload steam has eased up and carload screenings shows a little activity, but other sizes are slow. Country steam is quiet and country domestic is just beginning to pick up. The tonnage of threshing coal this year is so small that it is not a factor any more. There is no change in retail prices and practically no early delivery of coal on account of rainy weather.

The oil refineries in the St. Louis switching limits are beginning to use more coal on account of warm weather making a better demand for gasoline. A continuous period of two warm weeks will show an increase of almost 25 per cent in the tonnage of coal used in the refineries.

Kentucky Pick-Up Continues

While business is not at all rushing, volume has been somewhat better over the past week or ten days. Salesmen in the North and West are doing more, especially the commission salesmen, who have been making a hard drive, and retailers have been placing slightly better orders. Indus-

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern					Midwest				
	Market Quoted	July 9 1923	June 23 1924	June 30 1924	July 7 1924†		Market Quoted	July 9 1923	June 23 1924
Smokeless lump.....	Columbus.....	\$5.85	\$3.85	\$3.85	\$3.75@4.00	Franklin, Ill. lump.....	Chicago.....	\$3.90	\$2.75
Smokeless mine run.....	Columbus.....	3.25	2.20	2.20	2.10@ 2.35	Franklin, Ill. mine run.....	Chicago.....	3.00	2.35
Smokeless screenings.....	Columbus.....	3.10	1.30	1.30	1.10@ 1.50	Franklin, Ill. screenings.....	Chicago.....	1.65	1.80
Smokeless lump.....	Chicago.....	6.10	3.60	3.60	3.50@ 3.75	Central, Ill. lump.....	Chicago.....	2.60	2.35
Smokeless mine run.....	Chicago.....	3.60	2.00	2.00	1.75@ 2.00	Central, Ill. mine run.....	Chicago.....	2.10	2.10
Smokeless lump.....	Cincinnati.....	6.00	3.85	3.85	3.75@ 4.00	Central, Ill. screenings.....	Chicago.....	1.35	1.55
Smokeless mine run.....	Cincinnati.....	3.60	1.85	1.80	1.60@ 2.05	Ind. 4th Vein lump.....	Chicago.....	3.35	2.85
Smokeless lump.....	Cincinnati.....	3.35	1.50	1.10	1.00@ 1.25	Ind. 4th Vein mine run.....	Chicago.....	2.60	2.35
Smokeless screenings.....	Cincinnati.....	5.35	4.30	4.30	4.25@ 4.40	Ind. 5th Vein screenings.....	Chicago.....	1.60	1.80
Smokeless mine run.....	Boston.....	2.25	2.00	1.95	1.65@ 2.20	Ind. 5th Vein mine run.....	Chicago.....	2.85	2.35
Clearfield mine run.....	Boston.....	2.85	2.45	2.50	2.00@ 2.75	Ind. 5th Vein screenings.....	Chicago.....	2.10	2.10
Cambria mine run.....	Boston.....	2.50	2.15	2.15	1.80@ 2.50	Ind. 5th Vein mine run.....	Chicago.....	1.45	1.60
Bomerset mine run.....	Boston.....	2.50	2.15	2.15	1.80@ 2.50	Mt. Olive lump.....	St. Louis.....	2.85	2.85
Pool 1 (Navy Standard).....	New York.....	3.50	2.70	2.70	2.50@ 2.90	Mt. Olive mine run.....	St. Louis.....	2.50	2.50
Pool 1 (Navy Standard).....	Philadelphia.....	3.55	3.00	3.00	2.60@ 3.00	Mt. Olive screenings.....	St. Louis.....	2.00	2.00
Pool 1 (Navy Standard).....	Baltimore.....	2.75	2.20	2.20	1.90@ 2.40	Standard lump.....	St. Louis.....	2.35	2.15
Pool 9 (Super. Low Vol.).....	New York.....	2.70	2.20	2.20	1.95@ 2.35	Standard mine run.....	St. Louis.....	1.85	1.80
Pool 9 (Super. Low Vol.).....	Philadelphia.....	2.60	1.85	1.85	1.80@ 1.90	Standard screenings.....	St. Louis.....	1.15	1.45
Pool 9 (Super. Low Vol.).....	Baltimore.....	2.35	1.85	1.85	1.65@ 2.00	West Ky. lump.....	Louisville.....	2.25	2.00
Pool 10 (H.Gr. Low Vol.).....	New York.....	2.25	1.85	1.85	1.65@ 1.90	West Ky. mine run.....	Louisville.....	1.65	1.55
Pool 10 (H.Gr. Low Vol.).....	Philadelphia.....	2.25	1.85	1.85	1.60@ 1.70	West Ky. screenings.....	Louisville.....	1.15	1.55
Pool 10 (H.Gr. Low Vol.).....	Baltimore.....	2.25	1.65	1.65	1.40@ 1.85	West Ky. lump.....	Chicago.....	2.40	1.85
Pool 11 (Low Vol.).....	New York.....	1.80	1.60	1.60	1.35@ 1.60	West Ky. mine run.....	Chicago.....	1.15	1.60
Pool 11 (Low Vol.).....	Philadelphia.....	1.85	1.50	1.50	1.50@ 1.60				
Pool 11 (Low Vol.).....	Baltimore.....	2.05	1.55	1.55	1.50@ 1.60				

High-Volatile, Eastern					South and Southwest				
	Market Quoted	July 9 1923	June 23 1924	June 30 1924	July 7 1924†		Market Quoted	July 9 1923	June 23 1924
Pool 54-64 (Gas and St.).....	New York.....	1.65	1.50	1.50	1.35@ 1.65	Big Seam lump.....	Birmingham.....	3.25	3.00
Pool 54-64 (Gas and St.).....	Philadelphia.....	1.55	1.55	1.55	1.40@ 1.60	Big Seam mine run.....	Birmingham.....	2.05	1.90
Pool 54-64 (Gas and St.).....	Baltimore.....	1.75	1.50	1.45	1.40@ 1.50	Big Seam (washed).....	Birmingham.....	2.35	2.00
Pittsburgh ac'd gas.....	Pittsburgh.....	2.40	2.40	2.40	2.30@ 2.50	S. E. Ky. lump.....	Chicago.....	3.25	2.10
Pittsburgh gas mine run.....	Pittsburgh.....	2.10	2.10	2.10	2.00@ 2.25	S. E. Ky. mine run.....	Chicago.....	2.35	1.60
Pittsburgh mine run (St.).....	Pittsburgh.....	1.95	1.85	1.85	1.75@ 2.00	S. E. Ky. lump.....	Louisville.....	2.75	2.10
Pittsburgh slack (Gas).....	Pittsburgh.....	1.50	1.20	1.20	1.15@ 1.25	S. E. Ky. mine run.....	Louisville.....	1.85	1.50
Kanawha lump.....	Columbus.....	3.00				S. E. Ky. screenings.....	Louisville.....	1.05	.95
Kanawha mine run.....	Columbus.....	1.85				S. E. Ky. lump.....	Cincinnati.....	3.25	2.50
Kanawha screenings.....	Columbus.....	1.10				S. E. Ky. mine run.....	Cincinnati.....	1.60	1.45
W. Va. lump.....	Cincinnati.....	3.25	2.25	2.25	2.00@ 2.50	S. E. Ky. screenings.....	Cincinnati.....	1.05	.90
W. Va. gas mine run.....	Cincinnati.....	1.75	1.35	1.40	1.25@ 1.60	Kansas lump.....	Kansas City.....	4.00	4.50
W. Va. steam mine run.....	Cincinnati.....	1.75	1.35	1.40	1.25@ 1.60	Kansas mine run.....	Kansas City.....	3.25	3.50
W. Va. screenings.....	Cincinnati.....	1.05	.90	.85	.75@ 1.00	Kansas screenings.....	Kansas City.....	2.60	2.50
Hooking lump.....	Columbus.....	2.75	2.45	2.45	2.25@ 2.65				
Hooking mine run.....	Columbus.....	1.85	1.70	1.70	1.60@ 1.85				
Hooking screenings.....	Columbus.....	1.25	1.35	1.35	1.30@ 1.45				
Pitts. No. 8 lump.....	Cleveland.....	2.55	2.35	2.35	2.00@ 2.75				
Pitts. No. 8 mine run.....	Cleveland.....	1.90	1.85	1.85	1.85@ 1.95				
Pitts. No. 8 screenings.....	Cleveland.....	1.25	1.10	1.10	1.05@ 1.20				

* Gross tons, f.o.b. vessel, Hampton Roads.

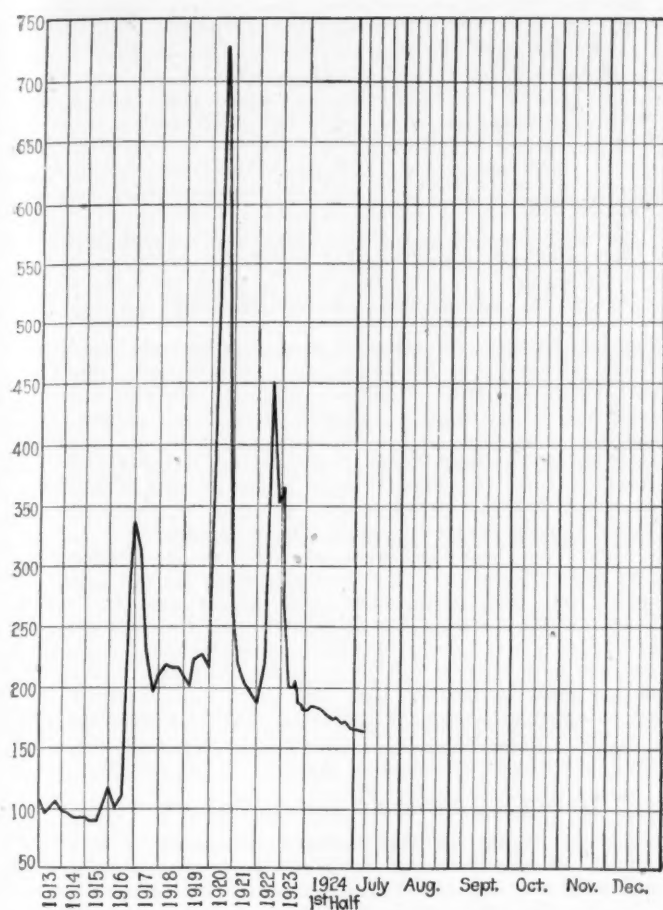
† Advances over previous week shown in heavy type, declines in italics.

‡ On strike.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Market Quoted	Freight Rates	July 9, 1923		June 30, 1924		July 7, 1924†	
				Independent	Company	Independent	Company	Independent	Company
Broken.....	New York.....	\$2.34			\$7.75@8.35		\$8.00@8.85		\$8.00@8.95
Broken.....	Philadelphia.....	2.39			7.00@ 8.10		8.70@ 8.85		8.80@ 8.95
Egg.....	New York.....	2.34			8.00@ 8.35		8.75@8.85		8.85@ 8.95
Egg.....	Philadelphia.....	2.39			8.10@ 8.35		8.80@ 8.85		8.90@ 8.95
Egg.....	Chicago.....	5.06			8.50@ 12.00		7.86@ 8.00		7.94@ 8.00
Stove.....	New York.....	2.34			8.50@ 12.00		8.00@ 8.35		8.55@ 9.20
Stove.....	Philadelphia.....	2.39			8.15@ 8.35		9.15@ 9.80		8.25@ 9.10
Stove.....	Chicago.....	5.06			8.50@ 12.00		8.17@ 8.30		8.30@ 8.40
Chestnut.....	New York.....	2.34			8.00@ 8.35		8.45@ 8.95		8.55@ 9.05
Chestnut.....	Philadelphia.....	2.39			8.15@ 8.35		8.80@ 8.85		8.90@ 8.95
Chestnut.....	Chicago.....	5.06			8.50@ 12.00		8.08@ 8.13		8.18@ 8.24
Range.....	New York.....	2.34			8.30		8.70		8.80
Pea.....	New York.....	2.22			6.75@ 8.00		4.50@ 5.50		5.50@ 6.00
Pea.....	Philadelphia.....	2.14			7.00@ 7.50		5.75@ 6.25		5.75@ 6.00
Pea.....	Chicago.....	4.79			7.00@ 8.50		5.36@ 5.91		5.36@ 5.91
Buckwheat No. 1.....	New York.....	2.22			2.75@ 3.50		3.00@ 3.15		3.00@ 3.15
Buckwheat No. 1.....	Philadelphia.....	2.14			2.75@ 3.50		3.00		3.00
Rice.....	New York.....	2.22			1.80@ 2.50		2.25		2.00@ 2.25
Rice.....	Philadelphia.....	2.14			1.75@ 2.50		2.25		2.25
Barley.....	New York.....	2.22			1.25@ 1.50		1.50		1.50
Barley.....	Philadelphia.....	2.14			1.15@ 1.50		1.50		1.50
Birdseye.....	New York.....	2.22			1.60		1.60		1.60

* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.



Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

Index	1924			1923
	July 7	June 30	June 23	July 9
Index	164	166	166	197
Weighted average price	\$1.99	\$2.01	\$2.01	\$2.38

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board.

trial business continues a little quiet due to the dullness in some metal-working interests, the auto trade, etc.

The eastern Kentucky fields appear to be operating on a very fair basis and are increasing production as a result of better movement to the Lakes, to large retailers and to scattered utilities and industrial consumers. Cool weather has resulted in ice- and cold-storage plant consumption being relatively light, while refiners are principally burning fuel oil instead of coal on the present screenings market. Prices show no material change.

Western Kentucky is producing a little more. Prices in western Kentucky show no change over the week. Strip operators apparently are very busy. There has been a fair movement from western Kentucky on stove sizes to the South, with some scattered movement to nearby districts, Michigan and the North and Northwest.

Northwest Trade Is Slow

The coal market at Duluth is still very quiet and sales are at a standstill with the exception of scattering public-utility contracts. The only movement of coal from the docks is by the railroad companies, which are taking coal for storage elsewhere against the time of the grain movement and possible coal movement.

The movement to the docks last week was good. Thirty-one cargoes arrived in all, of which three were hard coal. Twenty-two were reported en route, of which seven are hard coal. This report of the cargoes en route is exceptionally good for the present season. The docks here need about 1,400,000 tons of anthracite to carry through. This

means that the shipments must continue steadily until the fall in order to supply the demand.

The soft-coal situation may be worse than it looks too. Many mines are reported shut down and many of the lake carriers are tied up, as the result of a scarcity of cargoes in grain and ore.

Little anthracite is moving out now. Retailers report poor collections. Anthracite took its monthly increase of 10c. on July 1. Prices of bituminous are the same, and seem to be holding firmly.

July finds the coal market at Milwaukee exceedingly quiet but hopeful. With the exception of the usual monthly advance of 10c. on all grades of anthracite except buckwheat, coal prices remain unchanged. Soft coal moves sluggishly. The record of cargo arrivals during June shows an aggregate of 143,197 tons of anthracite and 273,363 tons of soft coal. This makes the total receipts for the season thus far by lake 282,505 tons of anthracite and 599,462 tons of soft coal.

West Fights for Business

A scramble for business in Oklahoma has resulted in a slash of from \$1 to \$1.50 a ton in the price of Henryetta coal. It is now quoted at \$4@\$4.50 for lump, \$3.50@\$4 for nut; \$3@\$3.75 for mine run and \$2@\$2.25 for screenings. Few mines are working.

There has been little change in the situation in Kansas. The threshing demand is a little more brisk, but there has been no improvement in the other markets. A slight increase in storage of Arkansas semi-anthracite is apparent. Prices on both Kansas and Arkansas coals are unchanged.

The only change noted in the Colorado market was another advance in prices effective July 1. Walsen and Canon City lump, nut and slack being \$4.75, \$4.25 and \$3.25 respectively. Crested Butte high-grade anthracite is \$7. Dealers still refuse to place summer orders and movements on all sizes are slow. Mines worked on an average of 18 hours last week. Forty-seven per cent of working time lost was attributed to "no market."

In Utah coal prices are on the upgrade. Operators have just announced a new schedule as follows: Lump, \$4.25; stove, \$4.25; domestic lump, \$4; nut, \$3.50; slack, \$1.50. This schedule is a little different from the old schedule in matter of grades. There has been very little storage of coal so far. Mines are operating a little better than two days a week. Practically no coal contracting is reported.

Some Improvement at Cincinnati

The Cincinnati market shows signs of slight improvement. Both steam and domestic inquiries are numerous and real orders significantly better. There was more than a 15 per cent increase last week in moving tonnage from West Virginia and Kentucky in spite of a two-day rest in mining in connection with the national holiday. There also was a slight increase in lake business and buyers are saying here that their requirements for July will be from 30 to 50 per cent above those for June. The additional demand has not thus far caused any enhancement of wholesale prices, which continue so low as to afford the barest margin of profit.

With midsummer dullness prevailing in the domestic trade, there is practically no change in the Columbus market. Buying on the part of all classes of users is limited to immediate wants. Everyone seems to be playing a waiting game. Domestic trade is not quite as brisk as formerly. Householders in many cases are holding off in the belief that low prices will continue throughout the summer. Smokeless and splints are in the best demand from dealers although a fair amount of southern Ohio grades is sought. Retail prices are unchanged and are generally well maintained. Owing to lack of production and the closing of many large mines there is not much distress coal on the market. Steam trade is quiet, as has been the rule for several months.

Business in the Cleveland market fell off because of the holiday, but spot prices have not shown any weakening due to this cause. Demand for lake cargo fuel is lessening, which is attributed to the heavy tonnages now at the upper docks and the slow movement therefrom. Inquiries are negligible in the steam trade, and an active resumption of industrial operation is hardly looked for before the middle of July. Railroads report no improvement in the volume of general traffic and this has resulted in the curtailment of their consumption. Despite the conditions herein set forth, there is a feeling of optimism that the low point in coal

supply and demand has about passed, and an upturn will come within the next thirty days.

The Pittsburgh market shows no improvement. Prices are unchanged, except that slack is off 5c. This is due to offerings of strip mines, which crush coal to make slack, as that at least can be sold.

The entire trade at Buffalo is even more quiet than usual at this time of the year, though this is the dull season. And the outlook is far from promising. Prices are lower than at any other time since the war.

Inaction prevails in the Toronto market with practically no demand for soft coal. Although the hard-coal market is generally slow at this time of year, one Toronto firm reports fairly brisk business. The small dealers, however, are getting very few orders.

New England Market Almost Stagnant

In New England the steam-coal trade drags along with almost no relieving features. Both all rail and by water there is still a great dearth of business, and in no direction is there much hopeful sentiment for July and August. Output is being held down in drastic fashion, but there are accumulations at practically every pier. Inquiry is extremely light and trade is almost stagnant.

At Hampton Roads the shippers are following out their close-hauled policy of May and June. On No. 1 Navy Standard Pocahontas and New River the range of \$4.25@ \$4.40 per gross ton f.o.b. vessel still obtains, with now and then a slight modification to dispose of distress coal. The less desirable grades sell down to \$3.85, but these are not much heard from in this market. Occasionally there are mixtures offering at the railroad wharves for distribution inland that account for prices on cars at less than \$5.50, but the No. 1 coals are being held with reasonable firmness at from that figure to \$5.75.

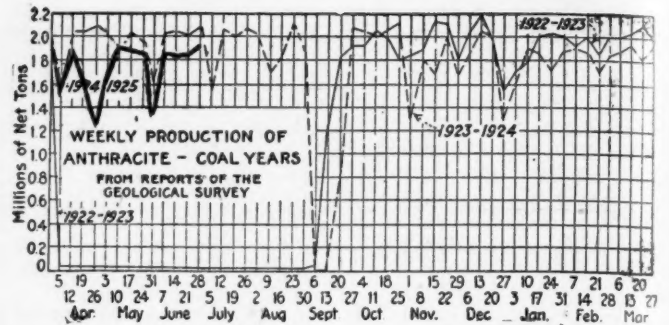
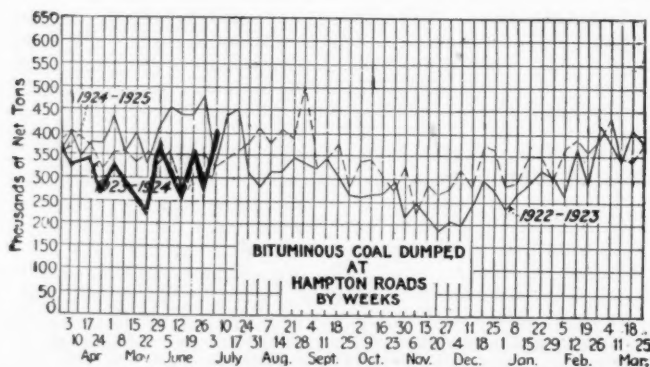
All-rail from central Pennsylvania trade is particularly dull, although not much different from any time since March. A few producers of non-union coals are making special efforts to move output this month to show the organization how idle it is to make labor contracts on the present union scale. Prices are therefore reduced in some quarters, but it is hard to find users even at a much lower level.

At retail the trade shows the demoralization consequent upon such a situation at wholesale. During last week a municipal school contract in the vicinity of Boston was taken at less than \$6.42 per net ton delivered. Subtracting teaming charges, marine freight, discharging, etc., leaves rather a small residuum for the operator.

Seaboard Markets Dull but Hopeful

Conditions at New York underwent practically no change during the last week. Prospects of increased business are not evident at present. Coal continues to come to tidewater in increased tonnage, and as a result is being sold at what are considered low prices. Buying along the line is a trifle more brisk and prices are on a firmer basis. Few contracts are reported as closed recently. Some railroads are said to be adding to their reserves and contract coals are moving easily, but consumers are not inclined to take more than their contracts call for.

The Philadelphia market remains flat. The holiday may add a little impetus to the trade this week. Renewed buying is believed to be almost at hand, as stockpiles are disappearing, except at utility plants. Industrial conditions, however, are not much improved. There has been a slight softening in prices in desperate drive for business, and



this has induced a number of producers to meet quotations.

The situation in Baltimore and vicinity with regard to both steam and gas coal continues most uninterestingly dull. Low prices continue to prevail, but there is not much sacrificing at tide, as fuel handlers are cautious in placing their orders without an assured outlet. After a very poor start in June the export trade woke up and a fair total went out for foreign delivery. Fourteen steamers carried 59,450 tons of cargo and 4,720 tons in bunkers.

There has been no favorable turn in the Birmingham coal market. Inquiry is extremely weak for all grades of coal. Industrial requirements are lighter than for several years at this season. There is little call for spot domestic and retail yards have pretty well stocked upon contract fuel and are now waiting for the ultimate consumer to order his winter coal—a matter that seems to be receiving scant attention at this time, as the retail market is showing little activity. Quotations f.o.b. mines have changed very little for several weeks, a few grades being slightly lower.

Hard-Coal Demand Quiet; Supply Ample

Labor troubles at the mines have ceased to affect the supply of hard coal at the New York tidewater market. Arrivals are ample for requirements. Except in the case of stove coal, demand is quiet; the movement of egg and chestnut in fact depends almost entirely upon the available tonnage of stove. All of the larger companies have added 10c. per ton to their June prices for egg, stove and chestnut, but because of the dullness of the market no change is reported by the independents, who find it difficult at times to obtain anything like company prices for their product. Some operators continue to break their broken coal in order to keep up mining, while pea coal is being stored in good volume. Steam coals are inactive and accumulating rapidly. There is practically no demand for free coals of the three small sizes and only contracts prevent heavier storing. Quotations for independent coals are low, only the best grades being held close to full company schedules.

The Philadelphia market is extremely quiet, the retail trade having slipped away to almost nothing and dealers are holding their orders generally. As expected, company shippers added 10c. a ton to the prices of the large sizes, leaving pea and steam sizes untouched. The independents also increased their prices on egg and stove, some leaving nut at last month's price, while others even reduced nut. Pea also was unchanged. Nut is moving so poorly that it may be necessary to store it soon, and pea is nearly as bad. Stove continues in strong demand, with egg also in good call. Retail prices are unchanged despite the increase at the mines.

Retail prices have again advanced in Baltimore as a result of new wholesale advances. The increase ranges from 25 to 50c. per ton, the new schedule being as follows: hard white ash, No. 1 (broken), \$15.50; No. 2 (egg), \$15.75; No. 3 (stove), \$16; No. 4 (chestnut), \$15.75; pea, \$11.50; buckwheat, \$8.50; Sunbury, No. 2 (egg), \$16; No. 3 (stove), \$16.25; Lykens Valley, No. 2 (egg), \$16.75; No. 3 (stove), \$17.

Car Loadings, Surpluses and Shortages

	Cars Loaded	
	All Cars	Coal Cars
Week ended June 21, 1924.....	903,700	140,807
Previous week.....	902,710	138,252
Week ended June 23, 1923.....	1,004,982	183,402
	Surplus Cars	
	All Cars	Coal Cars
June 22, 1924.....	359,644	167,315
Previous week.....	367,961	169,133
June 22, 1923.....	58,671	4,269
	Car Shortage	
	All Cars	Coal Cars
June 22, 1924.....	11,896	7,976
Previous week.....		
June 22, 1923.....		

Foreign Market And Export News

British Market Better but Still Below Average; Output Rebounds

The Welsh coal market is slightly better since the Whitsuntide holidays and the return of the railway shopmen to work, but sales are still below the average and shipping tonnage is ample. The passing of the French political crisis and the slight improvement in the exchange has led to more business with France. Some of the older and more expensively operated pits have been closed down as the result of the increase in working costs brought about by the recent agreement between operators and miners. In some cases the Ministry of Mines has intervened to induce the owners to reopen the closed pits, which will be done if the miners agree to work double shift to reduce the costs of operation. South American business is below the average and European business is very slow.

There has been an increased number of contract inquiries on the Newcastle market, especially for gas coals, but otherwise the market remains in the

same state as last week. Prices are very low, in many cases below the cost of production. The French State Railways have placed orders for 10,000 tons of Durham coking coals of guaranteed analysis at 20s. f.o.b., and also for 30,000 tons of Welsh coals. The Swedish State Railways have taken 60,000 tons of steams at 26s. 9d.; Copenhagen Sugar Works, 15,000 tons of steam smalls at 12s. 5d. f.o.b.; West-eras Railway of Sweden, 20,000 tons of steams at 21s. f.o.b. The French Est Railway is negotiating for 20,000 tons of Durham coals, and the German State Railways are inviting offers for steam coals.

Production by British collieries during the week ended June 21, a cable to *Coal Age* states, was 5,173,000 tons. This was a marked rebound from the previous week, when the output was only 3,236,000 tons owing to the observance of Whitweek, according to the official Board of Trade returns.

Fair Trade at Hampton Roads; Outlook Is Promising

Business is fair at Hampton Roads, with some contracts going to New England and with foreign movement dropping slightly, due to expiring contracts. General bunker business also is fair, though the market has weakened slightly.

There has been the usual slow-up for the holiday and shippers predicted a pick-up for the following week, the reduced holiday supply being expected to have a tendency to cause the market to strengthen somewhat.

The tone of the market is dull, but the outlook is promising, although no unusually heavy business is in sight for the immediate future. June's dumping record showed an improvement over the previous month, and the trade appeared fairly well satisfied with the situation.

Conditions in French Market Show Slight Change

The situation in the French coal market shows comparatively little change. Output is increasing and is being pushed as much as possible. Demand, however, is equal to supply; in fact, in the Nord and Pas-de-Calais there are no available stocks, the volume of orders in sized products precluding the collieries disposing of any quantities other than those covered by contract. The bituminous grades are quite neglected.

The recent decline of sterling has lessened the difference prevailing between the prices of British and French coals; nevertheless, the quotations on the latter continue to be the more attractive. The prices of anthracites remain prohibitive.

The supply of rolling stock to the mines is satisfactory and the freight

rate is quoted at 20 fr. Bethune-Paris.

In the Nord and Pas-de-Calais, the complements of wages granted by the companies as from November, 1923, and continued until June 30 of this year, have been renewed until Sept. 30, at which date further steps will be taken. It is likely, therefore, that prices will remain unchanged. However, until July 31 or Aug. 15, a summer premium of 8 fr. per ton will be allowed to retailers.

Ruhr Prices Cut 20 per Cent

Price schedules on all Ruhr district coals have been reduced 20 per cent, in order to stimulate sales, which have recently taken a sharp decline.

Export Clearances, Week Ended July 5, 1924

FROM PHILADELPHIA		Tons
For Cuba:		
Nor. Str. Lisbeth for Havana.....	
FROM BALTIMORE		
For Italy:		
Ital. Str. Giovanni.....		10,690
For Cuba:		
Br. Str. Berwindmoor.....		1,522
For France:		
Swd. Str. Stureholm.....		7,051
FROM HAMPTON ROADS		
For Canada:		
Nor. Str. Bjornstjerne Bjornson, for Three Rivers.....		8,161
Br. Str. Lord Ormonde, for St. John.....		5,367
For Chile:		
Jap. Str. Belgium Maru, for Iquique.....		4,621
For China:		
Br. Str. Romeo for Hong Kong.....		2,404
For France:		
Br. Str. Exmoor, for Marseilles.....		7,533
For Germany:		
Ger. Str. Ludwigsteiner, for Hamburg.....		3,034
For Italy:		
Ital. Str. Merghebb, for Porto Ferrajo.....		6,205
For West Indies:		
Nor. Str. Skogheim for Port of Spain.....		3,510

Hampton Roads Pier Situation

N. & W. Piers, Lamberts Pt.:	June 28	July 5
Cars on hand.....	1,205	1,238
Tons on hand.....	76,843	74,708
Tons dumped for week.....	102,165	142,164
Tonnage waiting.....	15,000	20,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,355	1,551
Tons on hand.....	981,200	115,200
Tons dumped for week.....	86,998	91,037
Tonnage waiting.....	2,851	167
C. & O. Piers, Newport News:		
Cars on hand.....	1,892	1,337
Tons on hand.....	94,665	69,036
Tons dumped for week.....	67,863	125,668
Tonnage waiting.....	2,305	14,710

Pier and Bunker Prices, Gross Tons

PIERS		June 28	July 5†
Pool 9, New York.....	\$4.60@	\$5.00	\$4.60@
Pool 10, New York.....	4.50@	4.75	4.50@
Pool 11, New York.....	4.35@	4.50	4.25@
Pool 9, Philadelphia.....	4.70@	5.05	4.70@
Pool 10, Philadelphia.....	4.45@	4.80	4.45@
Pool 11, Philadelphia.....	4.30@	4.55	4.30@
Pool 1, Hamp. Roads.....	4.35@	4.40	4.30@
Pool 2, Hamp. Roads.....	4.15@	4.20	4.15@
Pools 5-6-7, Hamp. Rds..	4.00@	4.10	4.00@

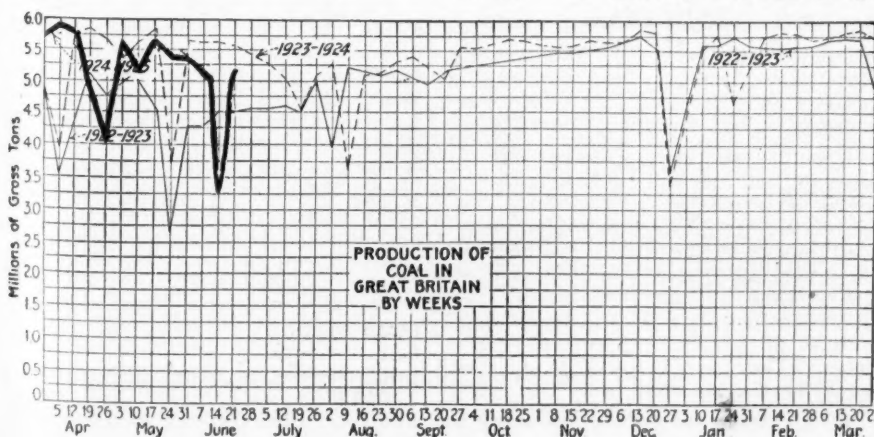
BUNKERS

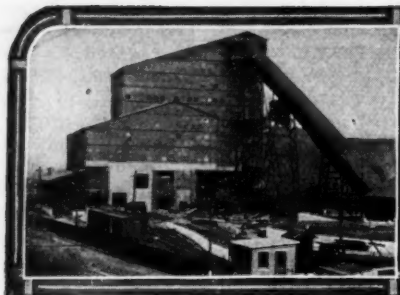
Pool 9, New York.....	4.90@	5.30	4.90@
Pool 10, New York.....	4.80@	5.05	4.80@
Pool 11, New York.....	4.65@	4.80	4.65@
Pool 9, Philadelphia.....	5.00@	5.40	5.00@
Pool 10, Philadelphia.....	4.75@	5.00	4.75@
Pool 11, Philadelphia.....	4.50@	4.80	4.50@
Pool 1, Hamp. Roads.....	4.40	4.55	
Pool 2, Hamp. Roads.....	4.20	4.20	
Pools 5-6-7, Hamp. Rds..	4.10	4.10	

Current Quotations British Coal f.o.b. Port, Gross Tons

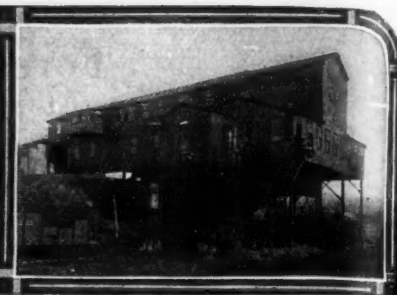
Quotations by Cable to <i>Coal Age</i>		June 28	July 5†
Admiralty, large....	28s. 3d. @	28s. 6d.	28s. 6d.
Steam smalls.....	18s. 6d. @	19s.	18s. @
Newcastle:			
Best steams.....	20s. @	21s.	19s. 6d. @
Best gas.....	23s. @	23s. 6d.	23s. @
Best bunkers.....	20s. @	21s. 6d.	22s.

† Advances over previous week shown in heavy type, declines in *italics*.





News Items From Field and Trade



ALABAMA

The Sloss-Sheffield Steel & Iron Co. has entered the retail coal trade by the establishment at its City Furnace plant of a battery of storage bins from which it will dispense direct to consumers its lump and washed nut coal as well as its line of domestic nut coke.

It is reported from Scottsboro, Jackson County, that the Pierce coal mines, near Limrock, have been purchased by a corporation which will place the mines in operation soon. This operation has been idle for about ten years. A spur track is now under construction from Limrock, on the Southern Ry., to the mine site.

The board of mine examiners will hold a session in the offices of C. H. Nesbitt, chief mine inspector, Lincoln Life Bldg., Birmingham, July 21-24, to consider applications from candidates who would occupy positions as mine foremen and firebosses in Alabama mines. The personnel of the recently appointed board is as follows: C. H. Nesbitt, chairman; Sam Y. Leith, C. M. Parker, C. E. Bowron, F. G. Long and J. S. Kellum.

COLORADO

During the month of May, Colorado mines produced 678,345 tons of coal. This is a decrease of 54,128 tons as compared with the corresponding month last year. The total number employed in and about the mines in May was 12,648.

The Victor-American Coal Co. has abandoned its Grey Creek mine and the State Public Utilities Commission has granted the Colorado & Southern R.R. permission to tear up the 7-mile spur line from Beshoar Junction to the mine site.

IDAHO

Teton coal is to get railroad service. The State Utilities Commission, following the long series of recent hearings, has ordered the Oregon Short Line to repair and operate its 11-mile spur from Teton Junction to the Brown Bear mine of the Teton Coal Co., and the coal company is required to post a bond of \$27,160 with the railroad company, covering the cost of putting the line back into service. The coal company guarantees to ship at least 29,920 tons of coal per year. The railroad had objected to spending the money on the spur, asserting that the effort of H. F. Samuels to open the mine was mainly a political move to further his probable candidacy for Governor and that he did not intend to produce much coal.

Samuels insisted he was in earnest as a coal producer and got a good many towns worked up over the prospect of getting coal from him at low cost. The hearings attracted much attention.

ILLINOIS

A. T. Allen has been appointed coal transportation agent of the Chicago & Eastern Illinois Ry. at Chicago. The position of manager of coal traffic, formerly held by the late D. R. Patterson is abolished. Mr. Allen's appointment was effective July 1.

Some Illinois mines are reopening. The Marion County Coal Co. has resumed work at its Glenridge mine after having been closed down since April 24. The mine at Rutland, which has been at a standstill for several weeks, also has been reopened. Coal rights under adjacent property have been obtained and it is thought that these rights will pave the way for other additions.

A receiver was asked for the O. K. Coal Co., of Marissa, in a petition filed in U. S. District Court at East St. Louis, on June 27, by Arthur C. Smith and John Henderson, stockholders, both of St. Louis, Mo. Gross mismanagement is charged. The company was incorporated in 1917 and operated under its own name until 1922, the petition states, at which time it entered into an agreement with the Egyptian Coal & Mining Co. whereby the latter gained control of the O. K. company, both companies having the same majority stockholders and officers. It is further alleged that the mines of the company were closed down this year and have been allowed to fill with water and gas, so that they are unworkable. The property of the O. K. company is estimated at \$125,000 in the petition.

INDIANA

Cairy Littlejohn, of Indianapolis, state mine inspector and formerly a resident of Hymera, Ind., has been admitted to the Sullivan County Bar.

About 60 per cent of Indiana mines are idle and the coal mining industry in the state still remains in the dumps. If the present rate of production is maintained during the remainder of the year, only about 50 per cent of the normal production will result. Operators say Indiana coal is suffering because of competition from non-union fields. They say a lower wage scale would be the solution.

W. J. O'Brien, of Chicago, is suing to gain possession of a majority of the

stock of the Glendora Coal Co., which he claims to have bought and paid for with \$577,500, but which has never been completely delivered. His suit is against the First National Bank of Vincennes; Joseph E. Paplante, its president; the Glendora Coal Co. and John L. Baker, its president, and Frank P. Emison, its treasurer. O'Brien claims Baker deposited only 1,785 shares of the stock and not the full 2,100, which would have given O'Brien control of the company.

According to a report by Cairy Littlejohn, chief mine inspector of Indiana, 12,289,296 tons of coal was mined in the state during the first half of the present fiscal year. The report shows that \$20,932,231.52 in wages was paid to Indiana miners during the same period. The total amount of wages for all the last fiscal year was \$45,920,877.54. The number of employees for the first six months of the present year, as shown in the report, totals 23,861, as compared with 31,189 for all of last year. The number of fatal accidents totals 33, which is less than for the same period of last year.

KENTUCKY

W. H. Jones, of Prestonsburg, has been appointed by Governor Fields as Chief Mine Inspector of the state, succeeding L. V. Blenkinsopp, of Lexington, whose term of office has expired, the latter having been appointed when Gov. Morrow, Republican, was in the Governor's chair.

Fred M. Sackett, of the Byrne & Speed Coal Co. and allied interests in Louisville, which operate a number of coal mines in the state, has filed papers as candidate for Republican nomination for the U. S. Senate, and will wage an active campaign in the autumn for election if he is nominated.

The annual production report of mines in the northeast Kentucky district recently completed by C. J. Neekamp, secretary of the Northeast Kentucky Coal Association, and F. E. Durham, statistician, shows the tonnage produced from 1910 to 1923, inclusive. A black and white chart in thermometer form shows production from 1906 to 1922, inclusive, along with tonnage for each mine, and total tonnages by mines from 1910 to 1922, inclusive. Figures by mines for 1906 to 1909 are not available, and only totals for the field in those years are shown. In 1923 the field broke all previous records with a total production from 180 mines of 7,464,185 tons, bringing field production from 1906 through 1923 to 55,672,525 tons.

The Himyar Mines, of the Himyar Coal Co., Domino, in Perry County, have closed indefinitely. A fire underground started several weeks ago. The blaze followed an explosion in which one man was killed and others hurt. The mines were sealed and the fire was reported out. When the fans were again started the blaze rekindled, and the mines have now suspended indefinitely.

Increases in tax assessments are being fought by many coal companies in the state. The St. Bernard company, whose properties were assessed at \$1,534,000, is fighting an increase of \$800,000; the Fordson Coal Co. is fighting an increase from \$2,000,000 to \$3,000,000, and the Kentland Coal Co., in Pike County, which made a return of \$1,600,000, is protesting a \$400,000 increase.

The Louisville & Nashville R.R. Co. some weeks ago denied a report of friction existing between that road and the Southern Ry. whereby the Southern would withdraw from the Middlesboro field, over refusal to pay an increased rental use on trackage of the L. & N., yet for some reason mines serving the Southern are shutting down. The Fork Ridge mines, employing 300 men, were ordered down on July 1.

Loading records from western Kentucky show four mines of the St. Bernard Mining Co. producing coal on June 26 and 27 under the new agreement with 20-per cent reduction in wages, whereby the workers withdrew from the United Mine Workers, and formed a Mutual Welfare Association. It was reported on June 28 that 310 men had been busy getting some of the plants in shape for operation, and that of the men who returned to work on June 25, six quit the next day.

MINNESOTA

Robert D. Loudon, president of the Loudon Coal Mining Co., of southern Illinois, now in receivership, has been indicted in Minneapolis by the grand jury, on a charge of embezzlement. He was arraigned in district court and entered a plea of not guilty. Bail was fixed at \$5,000. The charge brought by the grand jury was for grand larceny in the first degree, and alleges that as president of the company, he

embezzled \$2,600 of company funds by trading 2,600 dollar bonds for 160 acres of Montana land, placed in his own name. The Loudon Coal Co. was formed in Minneapolis by Mr. Loudon to operate coal yards to association members and thereby reduce the cost of fuel.

NEW YORK

The Pennsylvania Coal & Coke Co. reports a May deficit of \$49,540 after ordinary taxes, depreciation and depletion, but before federal taxes, comparing with a profit of \$79,707 a year ago. For the five months the deficit was \$86,513, against a profit of \$549,320 in the same period of 1923. The gross revenue in May was \$430,046, representing a decline of \$306,580 from last May.

The United States Distributing Corporation, New York City, will handle in excess of 5,000,000 tons of anthracite and 2,000,000 tons of bituminous coal in 1924, according to a statement by Harry N. Taylor, president of the corporation. This compares with 1,000,000 tons of anthracite and 300,000 tons of bituminous coal distributed last year. Both the corporation's full sales department and its distributing subsidiary, the U. S. Trucking Corporation, have extended their facilities this year to make possible the placing of this additional tonnage.

Since the beginning of Burns Bros., fiscal year, April 1, the company has retired \$94,300 of prior preference stock at 120 and dividends, leaving only \$775,000 of the original \$1,292,100 outstanding, Frank L. Burns, president, announced last week. Owing to the cool weather the earnings in April and May were better than were anticipated, and the company will enter the fall better off than last year, he declared.

NORTH DAKOTA

At the annual meeting of stockholders of the Washburn Lignite Coal Co., held at Minneapolis, plans were laid for continuing the successful operation of its mines at Wilton, where the company has produced lignite since 1901.

The following officers were re-elected for the ensuing year: President, W.

P. Macomber, Wilton, N. D.; Vice President, Stanley Washburn, Lakewood, N. J.; Secretary and Treasurer, Jefferson Steiner, Bismarck, N. D.; General Manager, W. P. Macomber, Wilton, N. D.

OHIO

The Jobs mine, at Murray City, has resumed work after a long suspension. About 50 men have been given work.

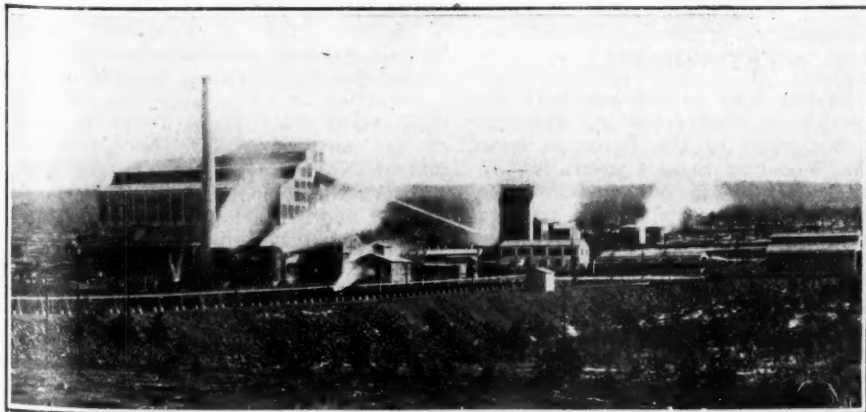
William S. Harman, of the W. S. Harman Coal Co., of Columbus, will soon start the development of a large stripping operation adjacent to the new power plant of the Ohio Power Co., located at Philo, on the Muskingum River. Mr. Harman and associates acquired the tract some time ago and a contract to furnish fuel to the power company has been signed and thus active development work will start. Steam shovels and other stripping equipment will be installed.

Bondholders of the Superior Coal & Dock Co., of Superior, Wis., which is a subsidiary of the Maynard Coal Co., of Columbus, now in the hands of William S. Harman and Frank L. Stein as receivers, met with representatives of the Ford Motor Co. in Columbus July 1 to discuss the offer made by the Ford Co. of \$658,500 for the dock properties. No change was made in the offer and a number of legal tangles appeared to cloud the situation. Further conferences will be held which may result in closing the deal.

A new chapter of the Joseph A. Holmes Safety Association has been organized at Senecaville, Ohio, designated as Chapter No. 95. The officers of this chapter are: J. S. Channel, president; C. O. Harding, vice-president; M. C. Miley, secretary-treasurer, and W. Christian, educational director. A charter was granted Cambridge Safety Chapter No. 96, Cambridge, on May 29. The officers of this chapter are: John Rigby, president; Charles Richardson, vice-president; H. C. Knapper, secretary-treasurer; J. W. Rarick, safety director, and Arthur G. Faught, educational director.

Medals have been received at the headquarters of the Ohio Mining Department, Columbus, from the Wheeling Steel Corporation, Wheeling, in recognition of the good work done by the chief and assistant inspectors of the department in the explosion of the Benwood mine in April in which 119 lives were lost. The medals are of bronze bearing a wreath inclosing a miner's safety lamp and the inscription "For Exceptional Service Rendered Humanity." On the reverse side is the inscription "Benwood Mine Explosion, April 28, 1924." The medals were awarded to Jerome Watson, chief inspector; P. W. Moore, first-aid and rescue supervisor, and the 10 Ohio deputies who aided in the rescue work.

The Red Jacket Consolidated Coal & Coke Co., which formerly had general offices at Detroit, has been taken over by the W. M. Ritter Lumber Co., of Columbus, and the general offices moved to the Hartman Building, Columbus. The company, which controls a large acreage with a capacity of ap-



Underwood Colliery, Pennsylvania Coal Co., Throop, Pa.

This mine on the Erie R.R., near Pittston, Lackawanna County, Pennsylvania, mines coal from six seams. The many beds in the anthracite region make its operations more permanent than those in the bituminous field.

Courtesy U. S. Distributing Corp.

proximately 100,000 tons monthly, is functioning as a separate entity, although a subsidiary of the Ritter company. H. T. Wilson is president and T. H. Wilson is sales manager. The properties are located in Mingo County, West Virginia.

OKLAHOMA

Drilling and shoveling contests among miners of the Miami district, with prizes ranging from \$10 to \$100, are to be held in July, during the Imaim Amohalko fiesta, under rules similar to those which prevailed last year.

Tough times in coal did not discourage the King Coal Carnival, which is held annually at Henryetta. This year it ran from July 1 to July 5, drawing people from many surrounding towns to see the street pageant and to enjoy the street carnival of the type that has been conducted in Henryetta each year for four years. Coal displays in store windows and special coal advertising of all sorts during the week helps merchandise the coal produced in the Henryetta field.

PENNSYLVANIA

The Westmoreland Coal Co. is preparing to develop a large tract of Pittsburgh coal recently purchased in Sewickley township, Westmoreland County.

Because mine workers at the Woodward colliery of the Glen Alden Coal Co., at Edwardsville, Luzerne County, closed down the operation to hold election of officers, district officials of the United Mine Workers may refuse to recognize the elected officers. Several fights occurred at the colliery during the day of election and arrests were made. An insurgent faction carried the election.

The Hazle Brook Coal Co. now has another colliery on its chain of operations. The new operation is located at Good Springs, near Maryd. The Skidmore and Buck Mountain veins have already been reached and fuel is being shipped.

A 5-ft. vein of coal was reported to have been struck last week in the No. 4 slope of the Evans Colliery Co. at Beaver Meadow, where Contractor Peter Ecker, of that place, is driving a tunnel from the Buck Mountain to the lower Gamma vein.

The Alliance Coal Co., a subsidiary of the Lehigh Coal & Navigation Co., is planning to install automatic controls on its pumps, as it has already done with its fans. These vital machines will be handled by one man, who will control them by means of a gage located in a substation on the surface.

That advertising urging the installation of special grates for the burning of small sizes of anthracite coal brought results is evidenced by the reports of dealers in the anthracite region. In Freeland, Pa., in the heart of the hard coal region, agencies report a large sale of special grates. The Coxie Traveling Grate Company at Port Carbon is now working on a new small heating plant which will burn steam sizes of anthracite.

The Shamokin Colliery Co., a \$250,000 corporation of Boston and Wilkes-Barre capitalists, recently acquired from Daniel H. McGhee and Joseph J. Evans, of Shamokin, their colliery located about two miles west of Mt. Carmel. Matt Stevens, of Wilkes-Barre, is president and general manager of the new company, and Ernest P. Chapin is secretary and treasurer. The Shamokin company recently leased a section of coal land and some valuable culm banks just west of the new acquisition.

The Rochester & Pittsburgh Coal & Iron Co. is rebuilding the tippie of its Helvetia mine near Punxsutawney, which was burned last October, employing Heyl & Patterson of Pittsburgh to do the work. The cost is to be about \$50,000 and the tippie will be finished in two months, when the mine will start up.

UTAH

Thirty-five prominent Salt Lake City business men met at the Alta Club one day recently where they gave a dinner in honor of L. F. Rains, head of the Carbon Fuel Co. The dinner was in recognition of Mr. Rain's part in developing the steel industry in Utah.

The U. S. Land Office will in the near future contest 20,000 acres of coal land in Emery and Carbon counties, claimed by the state as school sections. The national government contends the mineral character of the land was known prior to the date the state rights attached.

A coal tract comprising 1,818 acres in the Castlegate district has been let by the Register of the Land Office to L. A. Lawyer. It is one of the largest single units to be let in recent years. Under the terms of the lease not less than \$50,000 must be spent on bringing the property to an annual production of 60,000 tons of coal in three years. The government royalty is 10c. a ton.

VIRGINIA

The Amherst Coal Co. and the Logan County Coal Corporation have consolidated, and the name of the latter will be used for the new firm. The Norfolk office will be in charge of H. M. Fadley, former manager for the Amherst Coal Co.

WEST VIRGINIA

It having been established that the fire which resulted from the gas and dust explosions in the Benwood mine of the Wheeling Steel Corporation on April 28 has completely died out, the State Mine Department has recalled its corps of inspectors in charge since the explosion and the company is now preparing to resume operations in the mine. Men are at work clearing the motor road and placing new timbers along the main entry, which will require several months and will involve the expenditure of a large sum of money. An order has been promulgated to the effect that none but electric safety lamps shall be used by the employees at all mines of the corporation.

It is stated that ventilation at the Benwood mine at the present time is better than in any other mine in the northern Panhandle. Brattices and walls built on the aircourses and other changes made under state supervision insure a constant flow of air into all of the workings.

WISCONSIN

Bertram M. Ainsworth, of Milwaukee, who skipped when his arrest was ordered for conspiracy and using the mails to defraud in the Valley Coal & Dock Co. bankruptcy case, was captured by the police in New York City, June 25, and has been returned to Milwaukee for trial. Ralph Clements, of Cleveland, the other operator of the Valley company, surrendered some time ago and is out on bail awaiting trial.

CANADA

T. H. Williams has been appointed manager of the Reserve Mine, Western Fuel Corporation of Canada, to succeed Robert Henderson, resigned.

The Toronto Board of Health has let the contract for the anthracite required for the building under its control to W. Scott & Co. at \$15.50 per ton. There were six tenders for the contract, all of which quoted the same figure.

On June 20, the first box of coal was raised from No. 1 B, the newest and best equipped colliery of the Dominion Coal Co. at Glace Bay, N. S., which has cost nearly \$3,000,000. It has a normal capacity of about one million tons yearly. No. 1 B is exclusively an undersea mine, but how far under the Atlantic it will be possible to continue the extraction of coal will depend on how far ventilation can be economically developed.

The Canadian Collieries (D), Ltd., is opening a new slope in the Bright district, Vancouver Island, on the outcrop of the Wellington seam. It will be operated as an extension of the Wellington Ladysmith Colliery. The same company is unwatering No. 8 shaft, Cumberland. This development was carried out in the year 1914 and was stopped to permit concentration of production from other workings.

At the annual meeting of the Nova Scotia Mining Society at New Glasgow, N. S., on June 24, President Alex. McNeil, general superintendent of collieries for the British Empire Steel Corporation, in his presidential address emphasized the necessity for an increased duty on coal. He contended that if Nova Scotia was to compete with American coal in the markets of Quebec and Ontario the cost of production must be lowered and freight rates decreased.

New Companies

The Standard Fourth Vein Coal Co., of Linton, Ind., has been capitalized with 5,000 shares of no par value stock to mine, sell and ship coal and coke and other minerals. The incorporators are G. B. Taylor, of Erie, Pa., C. F. Shephard, of Ladd, Ill., and Peal Poole, of Linton, Ind.

Traffic News

Rate Cuts Allowed, Advances Denied in Kansas

The Kansas Public Utilities Commission has issued an order reducing freight rates on coal from southeastern Kansas to points in the central and western parts of the state. Some time ago the railroads filed an application for authority to increase some rates and lower others on joint line hauls of coal from the Kansas field. About 200 towns were affected. The commission denied the application to increase the rates, but allowed the railroads to make the reductions they proposed. The reductions amount to from 10c. to 25c. a ton. The Santa Fe, Katy, Rock Island, Union Pacific and the Frisco are the railroads involved.

North Dakota Not to Call Parley On Lignite Rates

The North Dakota State Railroad Commission will not call any conference for the purpose of considering new lignite rate tariffs, Frank Milhollan, chairman of the commission, said last week after an announcement had been made that the South Dakota commission was considering such action. The North Dakota commission which recently dismissed the complaint of railroads for higher lignite tariffs, takes the position that as the proposals for increased rates were instituted by the carriers, the burden of proof naturally fell upon them and if there is to be any conference of interested parties it would be up to them to take the initiative, Mr. Milhollan said.

B. & O. Must Pay Damages In Coke Rate Case

The Interstate Commerce Commission in a formal report in the case of the Pittsburgh Steel Co., against the Baltimore & Ohio R.R. and connecting lines held that the rate on coke, in carloads, from Cascade, W. Va., to Monessen, Pa., between June 10 and June 20, 1923, were unreasonable. The complainants were awarded \$7,789 with interest as reparation damages.

Decision on C. C. & O. Lease May Be Deferred

Decision of the Atlantic Coast Line and the Louisville & Nashville as to whether or not they will accept the Carolina, Clinchfield & Ohio lease under the terms laid down by the Interstate Commerce Commission may not be definitely decided for several months, according to a report last week. Since the order was handed down by the Interstate Commerce Commission thirty days ago, counsel for the railroads concerned have been making a careful study of the situation, but have not made a report. Under the terms of the order of the Interstate Commerce Commission the Atlantic Coast Line and the Louisville & Nashville will have six months in which to make their decision.

Assigned Car Case Deferred Again

The Interstate Commerce Commission announced on July 5 the tenth postponement of the hearing on distribution among coal mines of privately owned cars and cars for railroad fuel until Nov. 1, 1924. A hearing had been set on the last postponement for August 1.

Indiana Rate Cuts Hold

An injunction which nineteen railroad companies operating in Indiana sought in a suit filed in March to prevent the Indiana Public Service Commission from enforcing a schedule of rates which the commission approved in February on coal shipments from producing points to different group destinations, all in Indiana, has been denied by Judge Hay, in Superior Court, in Indianapolis. The court said there was no evidence to show the proposed rates would not be sufficient to produce an adequate return, including a reasonable profit, or that the rate would force the reduction of any rate, either interstate or intrastate, below such a level. The railroad companies, in their suit, alleged the schedule of rates was too low to yield a fair return.

Petitions asking lower freight rates on coal from certain Indiana points have been filed with the Interstate Commerce Commission against the Chesapeake & Ohio and other railroads. Rates on coal from Ohio, West Virginia and Kentucky to Elkhart, Ind., have been lowered, the petition states, and adjustment of eastern rates is asked.

Obituary

Maynard O. Gibbs, mining engineer and former well-known resident of Bluefield, W. Va., was killed a few days ago by a fall of slate in the No. 10 mine of the United States Coal & Coke Co. at Gary. The room in which Mr. Gibbs was killed had been regarded as dangerous for some time and Mr. Gibbs was warned as to its condition before he entered it. During the world war Mr. Gibbs served overseas. Returning to the United States in 1919, he obtained a position with the United States Coal & Coke Co. at Gary as a mining engineer. Mr. Gibbs was graduated from the Virginia Polytechnic Institute, at Blacksburg, as a civil and mining engineer. He was about thirty-two years of age and is survived by his wife and one daughter, aged six years.

Coming Meetings

First International Management Congress, Prague, Czechoslovakia, July 21-24.
Rocky Mountain Coal Mining Institute. Summer meeting, Aug. 7-9, Rock Springs, Wyo. Secretary, Benedict Shubart, 521 Boston Bldg., Denver, Colo.

New York State Coal Merchants Association, Inc., 14th annual convention, Sept. 4-6, Stamford-in-the-Catskills, N. Y.; headquarters Churchill Hall. Executive secretary, G. W. F. Woodside, Arkay Building, Albany, N. Y.

National Safety Council. Thirteenth annual safety congress Sept. 29 to Oct. 3, Louisville, Ky. Managing director and secretary, W. H. Cameron, 168 No. Michigan Ave., Chicago, Ill.

New Equipment

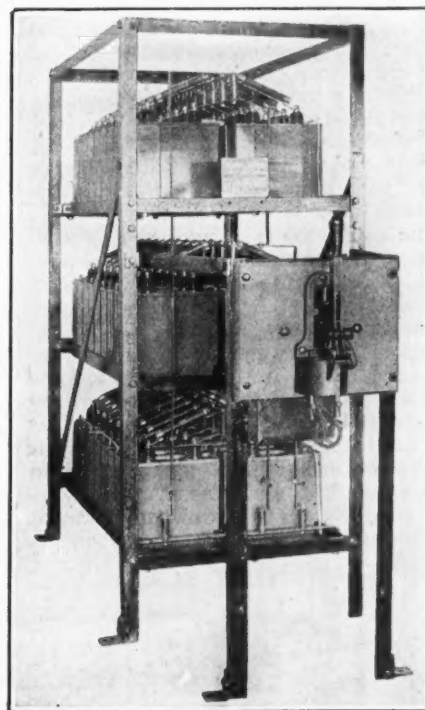
Power-Factor Correcting Unit

A static condenser of an improved design, said to be durable, efficient, of light weight and low cost per kilovolt-ampere, is now on the market. This device is designed to enable industrial concerns to improve the power factor of their electric circuits and thus increase the available capacity of their generators and transformers, decrease the energy losses in their distribution systems and improve their voltage regulation.

A specially high-quality dielectric is used by the manufacturers of this device, enabling them to cut down the thickness of the layers without reducing their efficiency, thus reducing the size and weight of the condenser.

Among other advantages claimed by the General Electric Co., who markets this condenser, are efficiency, simplicity of operation and convenience of location. No attendant is required, the condenser being placed in operation by closing a control switch. It may be left on the line indefinitely with but occasional inspection. Operation is claimed to be practically noiseless. The condensers may be designed for out-of-door service. There are no moving parts, thus eliminating the need for a special foundation.

Low losses are also a feature of this device, the losses in 2,300-volt equipment being approximately one-half of one per cent of the rated kilovolt-ampere capacity. For low-voltage equip-



Static Condenser Unit

This is a three-phase, 60-cycle, 180-kva. 2,300-volt static condenser. Power-factor correcting equipment will increase the kilowatt capacity of transformers, lines, and switches. Power savings are also possible because of the lower heat losses.

ments, a transformer is included, the losses being approximately 3 per cent.

The improved condenser consists of a number of units, a reactance for dampening out the higher harmonics in the voltage wave, a discharge resistance for draining the condenser charge when disconnected from the line and an oil circuit breaker for the control of the equipment. The number of condenser units is directly proportional to the capacity required. Each unit is composed of a large number of couples of metal-foil paper laminations as a dielectric. These units are mounted on a rack.

The condensers are being marketed for 40- to 125-cycle circuits, of 220 to 2,300 volts, in six sizes from 30 to 300 kva. For larger capacities, the complete units are arranged in tiers or banks. The weights of the standard units, without reactor and transformer, range from 805 lb. for the 30-kva. size to 5,510 lb. for the 300-kva. size.

Cable Connector with Enclosed Fuse

The Ohio Brass Company of Mansfield, Ohio, has developed a device known as a fused cutting-machine connector, made in any amperage for use on 250- and 500-volt circuits. The connector is of an unusual design, arranged so that it can be easily attached to the machine circuit or the trolley wire simply by turning the handle, this having a tightening effect on the clamp and giving a contact surface of about 3 in.

In cases where the connector is attached to the trolley wire it allows sufficient clearance for the locomotive to pass under it without removing the connector from the wire. Another rather convenient feature is the fact that in cases where it is necessary to run the mining machine cable under the track a plug connection at the end of the connector can be removed, thus eliminating the necessity of cleaning under the track sufficiently to allow the whole connector to pass, this plug connection being just slightly larger than the diameter of the mining-machine cable.

The connector is of rugged construction and is unaffected by moisture. The case is of the highest grade bakelite and the metal parts are of a high grade bronze, thus insuring proper insulation and maximum current-carrying capacity. A large disk on the handle prevents the operator's hand from slipping onto the metal parts that are not insulated.

The connector is equipped with a Trico fuse link and a case, thus insuring long life to the fuse compartment—eliminating practically all carbon de-

posits from the inside of the case and the possibility of leakage. The fuse case is so arranged that the machine operator cannot easily insert anything but the proper fuse.

The connector can be attached to the mining-machine cable with little or no expense by simply soldering the charged side of the cable into the lower plug terminal of the connector. It is also arranged with a glider to be used when traveling from one cutting place to another. The head of the clamp is drilled to receive a 4/0 wire, the wire being held into the connector by a set screw, thus making it easy to replace the glider. The fuse case is properly ventilated, eliminating the possibility of its exploding in the operator's hand.

Expensive mine fires are frequently caused by mining-machine cables becoming so greatly overheated that they cause fire. There is in general use today an all-rubber insulated mining-machine cable, which being expensive might well be given the protection that this cutting-machine connector will afford.

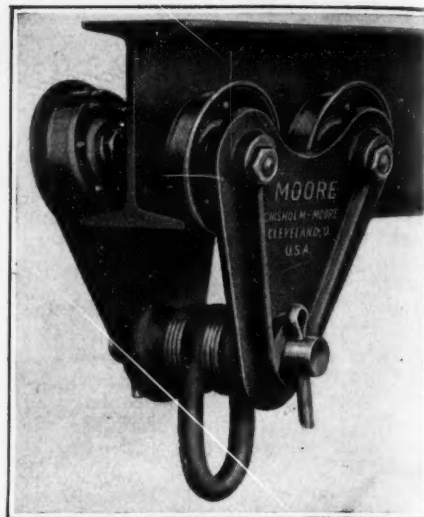
This connector also protects the mining machine and the machine operator. It eliminates the line contact made by the rather crude hook, which has been used for so many years. Compensation laws require a fused connection on the end of trailing cable and if such a connection is not used the mining company is liable to an increased charge.

Trolley with Ball-Bearing Pressed-Steel Wheels

A new trolley, the distinctive feature of which is that it has ball-bearing pressed-steel wheels, has been brought out by the Chishold-Moore Mfg. Co., Cleveland. The bearings are built in the wheel during its manufacture, so that the wheel and its bearings form a complete unit. The wheel is of 3-in. diameter and has a 1 1/8-in. tread.

The side frame is of steel and has an oscillating feature to distribute the load on all four wheels and thus assure positive traction. By the shifting of washers the trolley may be used for 4- to 7-in. I-beams and by the use of special separators it can be operated on larger beams. A hoist with swivel connection when hung from this trolley can swing a complete circle. When an I-beam is closed at both ends the trolley may be installed quickly by removing the equalizing pin shown in the lower part, thus separating the two side frames.

It will be noted that the trolley is simple in construction and convenient to install. It weighs only 17 1/2 lb. complete. It is made at present in one size to handle loads up to 1 ton.



Adjustable Hoist Trolley

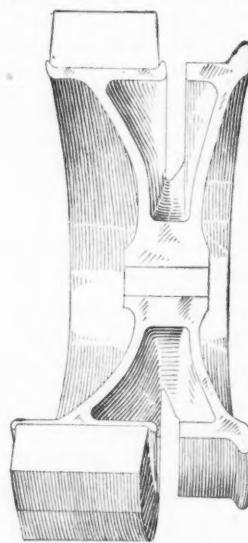
Ball-bearing wheels with bearings built into the wheels makes this trolley operate easily even under full load. This makes it an ideal outfit for machine shops and store rooms.

Wheel with Double Tread

A wheel designed with a double tread to run on rails or flat surfaces is being manufactured by the Vulcan Iron Works, of Wilkes-Barre, Pa., for sale by the Griffin Double Tread Wheel Co., 27 William St., New York. The illustration shows the wheel with a section cut out. It is made in the usual diameters and weights depending upon the service for which it is to be used.

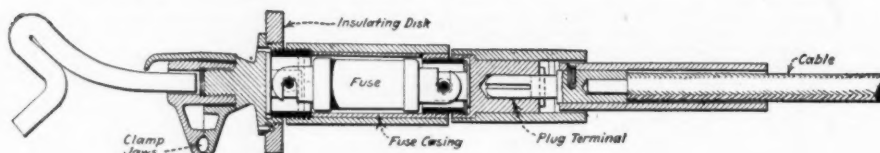
This wheel can be made from open-hearth steel or chilled steel made by the Griffin process. The manufacturers claim that the sections can be made as thin as the ordinary wheel and yet have sufficient strength.

On specially designed trucks, brakes may be applied to bear directly on the metal surface of the inner or rail tread. The flat large diameter tread is covered with a rubber tire. By the use of this wheel, it is easy to transfer from a rail to a floor or vice versa.



Wheel for Operating on Rail or Flat Surfaces

Wherever the distance between the top of the tie and the top of the rail is sufficient, this wheel can be used on either rails or flat surfaces. Such a wheel will no doubt find application in mine repair shops and foundries.



Special Protective Connector for Mine Cables

Many of the more serious delays to electric equipment in the mines are due to mining machine and drill machine cables being grounded. This clamp is designed so that an efficient connection can be made to the trolley wire. A fuse in the handle protects the equipment working from the cable circuit and also eliminates dangers to the workmen.